Bonn zoological Bulletin 61 (2): 255–281 December 2012

The herpetofauna of the Bijagós archipelago, Guinea-Bissau (West Africa) and a first country-wide checklist

Mark Auliya[1], Philipp Wagner[2,3] & Wolfgang Böhme[3]

[1] *Helmholtz Centre for Environmental Research – UFZ, Department of Conservation Biology, Permoserstr. 15, D-04318 Leipzig, Germany.*

[2] *Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085, USA.*

[3] *Zoologisches Forschungsmuseum Alexander Koenig, Adenauerallee 160, D-53113 Bonn.*

Abstract. An annotated checklist of amphibians and reptiles from the Bijagós archipelago (Guinea-Bissau) with comments on the species' distribution, systematics and natural history traits is presented here for the first time. During two field surveys 13 anurans and 17 reptile species were recorded from the archipelago of which several species represent either first records for the islands, i.e., *Silurana tropicalis*, *Hemisus g. guineensis*, *Leptopelis viridis*, *Hemidactylus angulatus*, *Chamaeleo gracilis*, *Trachylepis perrotetii*, *Philothamnus heterodermus*, *Toxicodryas blandingii*, *Naja melanolenca* and *Thelotornis kirtlandii* or first country records, i.e., *Amietophrynus maculatus*, *Ptychadena pumilio*, *P. bibroni*, *Phrynobatrachus calcaratus*, *P. francisci*, *Leptopelis bufonides*, *Hyperolius occidentalis*, *H. nitidulus*, *H. spatzi*, *Kassina senegalensis* and *Thrasops occidentalis*. Species diversity reflects savanna and forest elements and a complete herpetofaunal checklist of the country is provided.

Key words. West Africa, Guinea-Bissau, Bijagós archipelago, herpetofauna, first country records.

INTRODUCTION

The former Portugese colony Guinea-Bissau is an autonomous country since 1974 and is bordered by Senegal in the north, Guinea in the east and south, and by the Atlantic Ocean in the west (Fig. 1). It covers an area of approximately 36,125 km² between 10°52' and 12°40' N and 13°38' and 16°43' W. According to recent data, its human population is estimated at 1.596.677 (July 2011, The World Factbook 2012). The country can be divided into three characteristic types of landscape (1) scattered plain islands together with the flooded valleys describe the coastal zone, (2) coastal estuaries or "rias" outlined with mangrove swamps extend deep into the continent on the main rivers Rio Cacheu, Rio Mansoa, Rio Geba, Rio Grande de Buba and Rio Cacine, and (3) this second zone borders a moist savannah on a very low elevated shelf with the highest peak of 310 m a.s.l in the southeast of Guinea-Bissau, the foothills of the Fouta Djallon.

The Bijagós archipelago consists of 83 islands and islets with a surface of about 1,500 km², distributed across an area of about 11,000 km² (Fortes et al. 1998). According to IUCN (1991) 20 islands are permanently inhabited, 26 seasonal inhabited and 37 uninhabited. The islands soils are ferralitic, hydromorphic and halomorphic (Said & Fonseca 1990). The four islands surveyed within the study are Orango (158 km²), Bubaque (43 km²), Imbone (19 km²), and Soga Island (13 km²) (Fig. 1).

Guinea-Bissau's tropical climate is characterised by a dry season (November to May), and a wet season from June to October with average annual rainfall between 1,500–2,000 mm (IUCN 1992), whereas on the islands and the southeast of the mainland annual precipitation increases to 2,250–3,000 mm (Joop 1968). The Sudan-Zone in the north, the Guinea-Congolian zone and the West African Forest Block, in the south, frame Guinea-Bissau. A Guinean forest-savanna mosaic is the characteristic ecoregion of the country. The moist tropical Guinea savannas are of climatic origin, which are defined according to the length of the dry season, lasting two to six months. Of the edaphic-based vegetation, mangrove forests reflect the major formation. Originally mangrove forests represented 11 % of all vegetation of Guinea-Bissau, with 30 % of mangroves distributed on the Bijagós Islands. Dominant taxa are *Rhizophora racemosa*, *R. mangle*, and *Avicennia africana*.

On the islands of Orango and Bubaque, the inland vegetation, behind the mangroves, is characterized by a belt of littoral bush (Limoges & Robillard 1991a) and floral elements have xeromorphic leaves and > 5 m tall e.g., *Hibiscus tiliacens* (Malvaceae). *Chrysobalanus orbicularis* (Chrysobalanaceae) and *Ipomoea pes-caprae* (Convolvulaceae) are interspersed with Baobab, *Adansonia digitata* (Bombacaceae) and dense undergrowth e.g., *Strophantus* spp. (Apocynaceae). Also of edaphic origin are palm savannas dominated by the oil palm (*Elaëis guineeensis*),

Received: 03.04.2012
Accepted: 23.11.2012

Corresponding editor: F. Herder

Fig. 1. Map of Guinea-Bissau; Capital Bissau (black square); major Bijagós islands are named.

the next characteristic vegetation belt when moving towards inland. These are bordered by "depressions" of moist grass savanna (*Hyparrhenia*, *Andropogon*). Also *Raphia exica* (Arecaceae) is a characteristic element of these "valleys" (Limoges & Robillard 1991a). Evergreen bush-forests (up to 8 m tall) follow the partly swampy grass savannas inland e.g., *Mussaenda* spp. (Rubiaceae) or *Trema guineensis* (Ulmaceae) (Knapp 1973). Rich rainfall indicates patches of primary forest, representing the natural vegetation cover. According to Limoges & Robillard (1991a) these consist of half-moist and half-dry three-storied primary forests. In half-moist forests the upper story (canopy height around 30 m) is characterized by *Chlorophora regia* (Moraceae), and *Afzelia africana* (Caesalpiniaceae). *Elaiës guineensis* is the dominant species in the story below, whereas the undergrowth comprises shrubs and palm-shoots. Apart from these moist forests, which are distributed in the southern archipelago, the northern islands also support half-dry primary forests characterized by *Khaya senegalensis* (Meliaceae) and *Parinari excelsa* (Chrysobalanaceae). There are close phylogenetic relationships to the coastal regions of Guinea, Sierra Leone and Liberia (belonging to the western Guinean lowland forests), thus Guinea-Bissau's flora is assigned to the West African tropical Flora (IUCN 1986). Therefore, the flora of Guinea-Bissau consists of typical Sudano-elements e.g., *Acacia senegal, Dicherostachys cinerea* (Mimosaceae) together with elements of the tropical lowland evergreen rain forests of West Africa e.g., *Trichilia prieureana* (Meliaceae).

J. V. Barboza du Bocage published first data of Guinea-Bissau's herpetofauna in 1867. The majority of specimens originated from Bolama Isl. and Bissau (Bocage 1867, 1873, 1896a). Costa Martins, the Assistant Director of the Public Health Office of the Cabo Verde Archipelago made one of these collections (Bocage 1896b). Later, between 1898 and 1908, Francisco Newton who collected for the Lisbon museum, conducted inventories of the mainland herpetofauna (e.g. Antula [Bissau], Bambadinca, Buba, Geba, Farim, Sambel n'antá, including the nearby island Bolama Isl.). Boulenger (1905) identified and published an amphibian and reptile collection made by Leonardo Fea in 1898–1900. These specimens originated from Bissau, Bolama Isl., Farim, Cacheu, Cassine and Cambec. J. Bethencourt Ferreira (1902) published a checklist of amphibians and reptiles collected by Francisco Newton in 1900/1901. Some findings were recorded from Bolama Isl., the major data though originate from

Table 1. Habitat composition of the Bijagós islands. Source: Limoges & Robillard (1991).

Habitat	% of the archipelago
Moist forest	0.6
Closed Palm forest	25.8
Open Palm forest	5.8
Bush land	3.6
Forest savannah	5.6
Grass savannah	1.4
Moist savannah	6.9
Cultivated savannah	0.9
Mangroves	31.7

the mainland. Almost 40 years later in 1937–1938, Dr. Albert Monard, perpetuated herpetological research of Guinea-Bissau publishing many new records (Monard 1940a, b). The most detailed herpetofaunal surveys, as a program of the Portuguese inventory missions "Junta de Investigacoes Colonais" were conducted in 1945–1946, supervised by Fernando Frade. These collections were examined and published by Manaças (1947, 1949, 1950), in particular with reference to lizards, while Frade (1950) published the research results of the Varanidae, Typhlopidae, Leptyphlopidae and Colubridae. A small reptile collection was provided by Naurois (1969), who conducted a survey on the reproductive cycles of birds in the West African coastal zone from the Western Sahara to Guinea. He mentioned taxa from the islands Bubaque and Uno (Fig. 1). This collection was identified by Jean Guibé from the "Muséum National d'Histoire Naturelle" in Paris.

Due to the isolation of the Bijagós islands, not including Bolama Island (close to the mainland), no detailed field studies document the herpetofauna of the archipelago so far. In May 1991, Benoît Limoges and Marie-Josée Robillard carried out the most recent inventory of the insular vertebrate fauna (excluding amphibians) with the focus to establish protected areas (Limoges & Robillard 1991b). The present paper provides a first overview of the herpetofauna of the Bijagós archipelago including a checklist of all amphibians and reptiles recorded in Guinea-Bissau.

MATERIAL AND METHODS

Guinea-Bissau was visited twice; the initial survey was conducted in April and May 1993, while the second field survey was carried out mid May until mid August 1994, the transition from the dry to the wet season. The basecamp was on Bubaque Island, while three islands (Soga, Orango and Imbone) were visisted by motorboat. Due to this fact most specimens originate from Bubaque. The island of Orango was visited for eleven, while Imbone only for four days.

All voucher specimens were sampled by visual encounter, noosing and and setting nets during day and night excursions. Occasionally villagers captured specimens, or reported on taxa observed. Several taxa were collected dead after being killed by locals. Voucher specimens were preserved in 70 % ethanol and deposited in the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK) in Bonn. For additional taxonomic analysis aforementioned herpetological collection of R. de Naurois (1969) in 1961/62, from the Muséum National d'Histoire Naturelle in Paris/ France, was taken into account. Comparatively, collections from the localities Macenta and Sérédou, both in Guinea, were analysed.

RESULTS

Annotated Herpetofaunal Checklist of the Bijagós archipelago

AMPHIBIA

Arthroleptidae

***Leptopelis viridis* (Günther, 1869)**

Common name.– Savanna Tree Frog

Specimens examined.– Three, ZFMK 58265: Orango Isl., 7. VII.1994. 2 uncatalogued live specimens, Orango Isl. & Bubaque Isl., 2. VIII. 1994.

Distribution.– Schiøtz (1967) re-identified Boulenger's holotype of *Leptopelis hyloides* as a specimen of *L. viridis*. Thus, the type locality "Bolama" previously assigned to "*L. hyloides*" represents the first record for Guinea-Bissau. This study's findings provide the first record from the archipelago and the second record for the country after 88 years (Fig. 2).

Remarks.– The specimens were found in a dense secondary forest patch, surrounded by water basins (presumably used for livestock), with diverse herbaceous layers and aquatic plants. All specimens were located on branches of shrubs (around 1m) adjacent to the water sites. Advertisement calls were produced between 20.00h and 0.00h. *L. viridis* was associated with *Hyperolius occidentalis* and *Kassina senegalensis*, and represented the only arboreal species within this anuran community. At the time of the study this species was tentatively identified as *Leptopelis* cf. *hyloides* (Boesl 1995).

***Leptopelis bufonides* Schiotz, 1967**

Common name.– Ground Tree Frog.

Specimens examined.– Five, ZFMK 58263–64, 58266–67: Orango Isl., 7.VII.1994. One uncatalogued live specimen, Bubaque Isl., 28.VII. 1994.

Figs 2–9. **2.** *Leptopelis viridis*, Bubaque Isl.; **3.** *Leptopelis bufonides*, Orango Isl.; **4.** *Hemisus g. guineensis*, Bubaque Isl.; **5.** *Hyperolius occidentalis*, Bubaque Isl.; **6.** *Hyperolius spatzi*, Bubaque Isl.; **7.** *Hyperolius* spec., Bubaque Isl.; **8.** *Kassina senegalensis*, Bubaque Isl.; **9.** *Ptychadena bibroni*, Bubaque Isl.

Distribution.– *L. bufonides* is restricted to West African savanna, and so far has been recorded from Senegal (Böhme 1978), the Gambia (Barnett et al. 2001), Ghana (Schiotz 1967) Benin (Gilles et al. 2006), Nigeria (Walker 1968) and northern Cameroon (Amiet 2004). The present records are the first from the archipelago and Guinea-Bissau (Fig. 3).

Remarks.– This second *Leptopelis* savanna species occurs in syntopy with *L. viridis* and interspecific competition can be ruled out as this species appears to display strictly terrestrial behaviour, even calling from land (Gilles et al. 2006). Both localities of *L. bufonides* are characterised as savanna habitats. In one case (Orango Isl.) the habitat was arid-adapted vegetation dominated by grasses, no tree canopy, with some isolated *Acacia* trees. Three specimens were captured in a well. One frog, producing "advertisement calls", was located in a palm leaf about 2.5 m above the ground, and 5 m away from the coast (Imbone Isl.). On 8 July 1994 no fresh water could be located nearby. The species depends on temporary pools during the wet season.

Bufonidae

***Amietophrynus maculatus* (Hallowell, 1854)**

Common name.– Hallowell's Toad

Specimens examined.– Two, ZFMK 58268–69: Eticoga (Orango Isl.); 12./13.VI.1994.

Distribution.– This study documents first records from Guinea-Bissau. However, a collection of 197 specimens of *Amietophrynus regularis*, made by Frade 1945/1946 (Manaças 1949), could include *A. maculatus*. This toad was given species level rank by Hulselmans (1970), and isolated from the *A. regularis*-complex by Laurent (1972a). However, none of Frade's specimens originated from the archipelago.

Remarks.– Both specimens were collected in the village Eticoga, Orango Isl., characterised by diverse plantations (*Anacardium occidentale*), and paddy fields. A depression adjacent to the village cottages represents a large pond in the wet season. Large parts of this island are characterized by savanna-like vegetation, with many plants adapted to dry periods.

Hemisotidae

***Hemisus guineensis guineensis* Cope, 1865**

Common name.– Guinea Shovelsnout Frog

Specimens examined.– Two, ZFMK 58259: female, Eticoga (Orango Isl.), 7.VII.1994. ZFMK 58260: male, Bubaque Isl., 30.VII.1994.

Distribution.– A first record from Guinea-Bissau was provided by Boulenger in 1905, who referred to the species *Hemisus marmoratus* from Bolama Isl. close to the mainland (Laurent 1972b). The specimens in this study are the second record after 88 years, and represent the first record from the archipelago.

Remarks.– ZFMK 58259 was captured by locals on 19.VI.1994 (Fig. 4). For habitat descriptions refer to *Amietophrynus maculatus*. The remaining three specimens were collected in the morning on a moist shady slope. The habitat was at the edge of a depression, which most likely is filled with water during the wet season. Small pools were observed amid the clearing bordered by densely vegetated slopes. The loose soil was a mixture of clays and sands, and was covered by a layer of rotten leaves interspersed with seedlings. Andersson (1937) records termites as stomach contents in the taxon *H. marmoratus sudanensis*. The specimens collected in this study were feeding on termites at daylight. When grasped the frogs inflated their lungs and pressed their bodies to the forest floor. This anti-predator adaptation could disguise the frog, making it difficult for a predator to identify it as a tetrapod. Spieler (1997) observed this behaviour in nest guarding females.

Hyperoliidae

***Hyperolius nitidulus* Peters, 1875**

Common name.– Peter's Reed Frog.

Specimens examined.– One uncatalogued live specimen, Bubaque Isl., 10.VII.1994.

Distribution.– This is the first record from the archipelago and Guinea-Bissau.

Remarks.– Rödel et al. (2010) have shown that this species is morphologically and genetically distinct from *H. spatzi*, and both species are here recorded from Guinea-Bissau for the first time. No advertisement calls were heard during the entire field survey, most likely indicating that the reproductive period had not begun. This assumed time shift might reduce interspecific competition with *H. occidentalis*, with both species utilizing the same microhabitats.

***Hyperolius occidentalis* Schiotz, 1967**

Common name.– Western Reed Frog.

Specimens examined.– Five, ZFMK 58278–80 males, (12.–27.VII.1994); ZFMK 58281 (male), ZFMK 58282 (female), 10.VIII.1994; all Bubaque Isl. (also see Table 2).

Distribution.– This species record is the first from the archipelago and from Guinea-Bissau (Fig. 5).

Remarks.– According to villagers the secondary forest patch, where the species was recorded, was unaffected by fires for the previous 3–4 years. Slash-and-burn activities for rice cultivation, create clearings ("bolanhas") bordered by secondary forest. During the wet season they resemble shallow lakes, providing favourable living conditions for *H. occidentalis*, during both the dry and wet seasons. This species does not occur in primary forest with closed canopy or in Sudan-savanna formations, where secondary or gallery forests are not present. For further habitat descriptions see *Leptopelis viridis*. The species was ob-

served in syntopy with *L. viridis* and *Kassina senegalensis*. *H. occidentalis* occurs sympatrically with *H. picturatus*, the latter not having exposed calling sites (Schiøtz 1967). All specimens were localised in vegetation approximately 0.5 m above the ground when advertisement calls were recorded. The majority of specimens were observed on leaf surfaces or twigs of shrubs. During the dry season and heat of the day, one light yellow specimen was observed on a palm leaf in the characteristic resting position reducing evaporative water loss (Spieler 1997).

***Hyperolius spatzi* Ahl, 1931**
Common name.– Ahl's Reed Frog.
Specimens examined.– One, ZFMK 58291: Bubaque Isl., 28.VI.–12.VII.1994.
Distribution.– The record of *H. spatzi* from Bubaque Isl. represents the first record for the country and thus the most southern distribution of the species range (Fig. 6). *H. spatzi* has been recorded in Senegal and in the Gambia (Böhme 1978; Rödel et al. 2010; Schiøtz 1971).
Remarks.– The live specimen was observed amid a secondary forest patch on a white wall of a small abandoned house at approximately 2.5 m height. Böhme (1993) reported a similar habitat for the form *nitidulus*. According to Schiøtz (1971), *H. spatzi*, as a typical savanna species, is associated with habitats that resemble those of *H. occidentalis* (see above).

***Hyperolius* spec.**
Specimens examined.– One, ZFMK 58277: Bubaque Isl., 28.VI.1994.
Distribution.– This conspicuous phenotype does not resemble any morph of the region (Senegal to Guinea) (Fig. 7). It has been recognized as a new colour morph, and is recorded for the first time from Guinea-Bissau, and may represent a new taxon.
Remarks.– The specimen's snout-vent length is 26 mm. Compared to the other three species, there are some striking differences in colouration: more than half of the throat region is dotted and the belly is orange/red; dorsum distinctly marbled with black markings on a white background; interior part of the front limbs and femora, as well as the inside and underside of tibia and tarsus are coloured bright orange/red; iris is blackish. A villager collected the specimen from a secondary habitat, characterised by stands of *E. guineensis* and 3–5 m shrubs. The distinct pattern may be a form of mimesis, resembling bird faeces.

***Kassina senegalensis* (Duméril & Bibron, 1841)**
Common name.– Running Frog.
Specimens examined.– Two, ZFMK 58261–62: male & female, Bubaque Isl., 13.VII.1994.
Distribution.– Locality records on the archipelago present the species' northwesternmost distribution and are the first from Guinea-Bissau (Fig. 8).
Remarks.– For habitat descriptions also refer to *Leptopelis bufonides*. The water basins (resembling troughs) measured 3 m in length and 1.5 m in width; water depth was approximately 30 cm. The first heavy rains of the wet season filled these basins. Initially this terrestrial species was acoustically recorded under dense creeping herbaceous plants (Convolvulaceae), providing excellent shelter. Approximately 2 m high shrubs surrounded the troughs. Advertisement calls were first recorded in early June, always after sunset, around 20h00. The characteristic "plopping sounds" were first introduced by a solitary male acting as the initiator of the population, as described by Herrmann (1993). Consequently, all other males commenced calling, answering previous calls, and producing a distinctive call overlap as is described by Grafe (1999). These calls drowned out calls of other species, i.e., *Leptopelis bufonides* and *Hyperolius occidentalis*. Calling males were well camouflaged in their microhabitat. Even though calling sites were located approximately 30 cm away, it was not possible to make out most of the individuals. During several capture attempts it was observed that the frogs secretively crept to other sites sheltered by the dense herb layers.

Pipidae
***Silurana tropicalis* Gray, 1864**
Common name.– Tropical Clawed Frog
Specimens examined.– 21, ZFMK 58253–254: two subadults, Bubaque Isl., 27.VI.1994. ZFMK 58255–258: four adults, Imbone Isl., 08.VII.1994. ZFMK 58292: series of 15 larvae, Bubaque Isl., 29.VI.1994.
Distribution.– The island records within this study (from Bubaque and Imbone) represent the first records from the archipelago. Close to the mainland the species was recorded from Bolama Isl. (Boulenger 1905), Bissau, Março and Calequisse (Manaças 1947, 1951a).
Remarks.– The two subadult specimens and tadpoles were captured in a 1m² well amid dense secondary forest. The water in the well was clear, and depth was about 2 m. The site was about 10 m from a formation of *Avicennia africana*. The adult specimens were collected in deeper puddles in the only village on Imbone Isl. Both locations were almost closed by the canopy. Several behavioural observations were made at the well and under captive conditions. The breathing procedure of the frogs lasted about 10 seconds. The frogs emerged almost vertically from the dark bottom of the well, and submerged in the same manner. Besides the occurrence of adult frogs tadpoles of different metamorphic stages were also observed. Nieuwkoop & Farber (in Arnoult & Lamotte 1968) described stage "45" without barbles, which was observed together with "tentacled stages" resembling fish schools, about 10–25 cm below the water surface. The tentacled tadpoles never had contact with the base of the well or with its steep edges. It was difficult to make out distinct swim-

ming movements of the tadpoles. Only slight undulations of the tail filaments were observed, and breath-taking was practised in the same way as the adult frogs. The translucent appearance of all larval stages may represent a protection against predators from water and land. Predators from under water probably have difficulties in approaching an individual tadpole, due to their transparency and back-lit conditions. Besides, light reflection on the water surface also handicaps potential predators approaching from the land to follow the slow moving.

Tadpoles and their post-metamorphic stages were kept together in water tank. It was observed that subadult frogs fed on their tadpoles. The tank did not provide natural conditions, thus schooling behaviour was absent, and space was distinctly restricted. If stress behaviour was not responsible for cannibalism under captive conditions, it may also be a natural feeding behaviour of the metamorphic frogs to feed on their larvae, thus to minimise cannibalism, schooling behaviour and transparency may play a crucial role. Cannibalism enables the parental population to "exploit the nutrient resource, the energy of primary production by algae and micro-organisms" (Tinsley et al. 1996). Also, taking into consideration that during the dry season permanent water bodies are rare and overland migration probably is negligible, however in other Pipidae spp. i.e. *Xenopus muelleri* overland migration over long distances of has been observed (Loveridge 1953; in Tinsley et al. 1996).

Ptychadenidae

***Ptychadena bibroni* (Hallowell, 1845)**

Common name.– Broad-banded Grass Frog.

Specimens examined.– Seven, ZFMK 58288 (female) and 58289 (male), Orango Isl., 15./16.VI.1994. ZFMK 58283–87: one female (58283), all others males, Bubaque Isl., 19.VII.1994.

Distribution.– These island records also represent the first for the country (Fig. 9).

Remarks.– For habitat descriptions of the two specimens from Orango Isl. see *Leptopelis bufonides*. The remaining individuals were captured in a well in Bubaque village (approximately 30 m from the sea) between houses and secondary vegetation. The ZFMK specimens were collected between June and November similar to records of Gruschwitz et al. (1991). Active *Ptychadena bibroni* have been recorded during the first rains of the wet season.

***Phrynobatrachus calcaratus* (Peters, 1863)**

Common name.– Boutry River Frog

Specimens examined.– Two, ZFMK 58273, 58275: males, Bubaque Isl., 12.VII.1994.

Distribution.– This study records *P. calcaratus* from the archipelago and Guinea-Bissau for the first time based on findings provided by Perret (1988) (Fig. 10).

Remarks.– Irregular but intense rainfalls brought out this species after the dry season in mid June. Unidentified froglets of this genus (ZFMK 58276) were also observed in early August within the anuran community described below (see *Leptopelis viridis*). For habitat descriptions on Bubaque Isl. see *Ptychadena bibroni*.

***Phrynobatrachus francisci* Boulenger, 1912**

Common name.– Warty River Frog.

Specimens examined.– Six, ZFMK 58270–72: males, Orango Isl., 19.VI.1994. ZFMK 58274: male, Bubaque Isl., 12.VII.1994. ZFMK 58276: male, Bubaque, 27.VII.1994.

Distribution.– This study records *P. francisci* from the archipelago and also represents the first record from Guinea-Bissau (Fig. 11).

Remarks.– The collecting locality on Orango Isl. is described below (see *Leptopelis bufonides*). The specimens from Bubaque Isl. were found during the construction of a well in moist soil and in a well associated with *Ptychadena bibroni* (see above). Shrubby vegetation with a few sheltering coconut palms amid some houses characterises the habitat. These findings support the fact that *P. francisci* is found near both artificial and natural water bodies during the dry season. Compared to the nocturnal *P. natalensis*, *P. francisci* is explicitly diurnal and even heliophilic, as characterized by Lamotte & Xavier (1966: 361). Gruschwitz et al. (1991) observed *P. francisci* at daytime under bark, litter and logs.

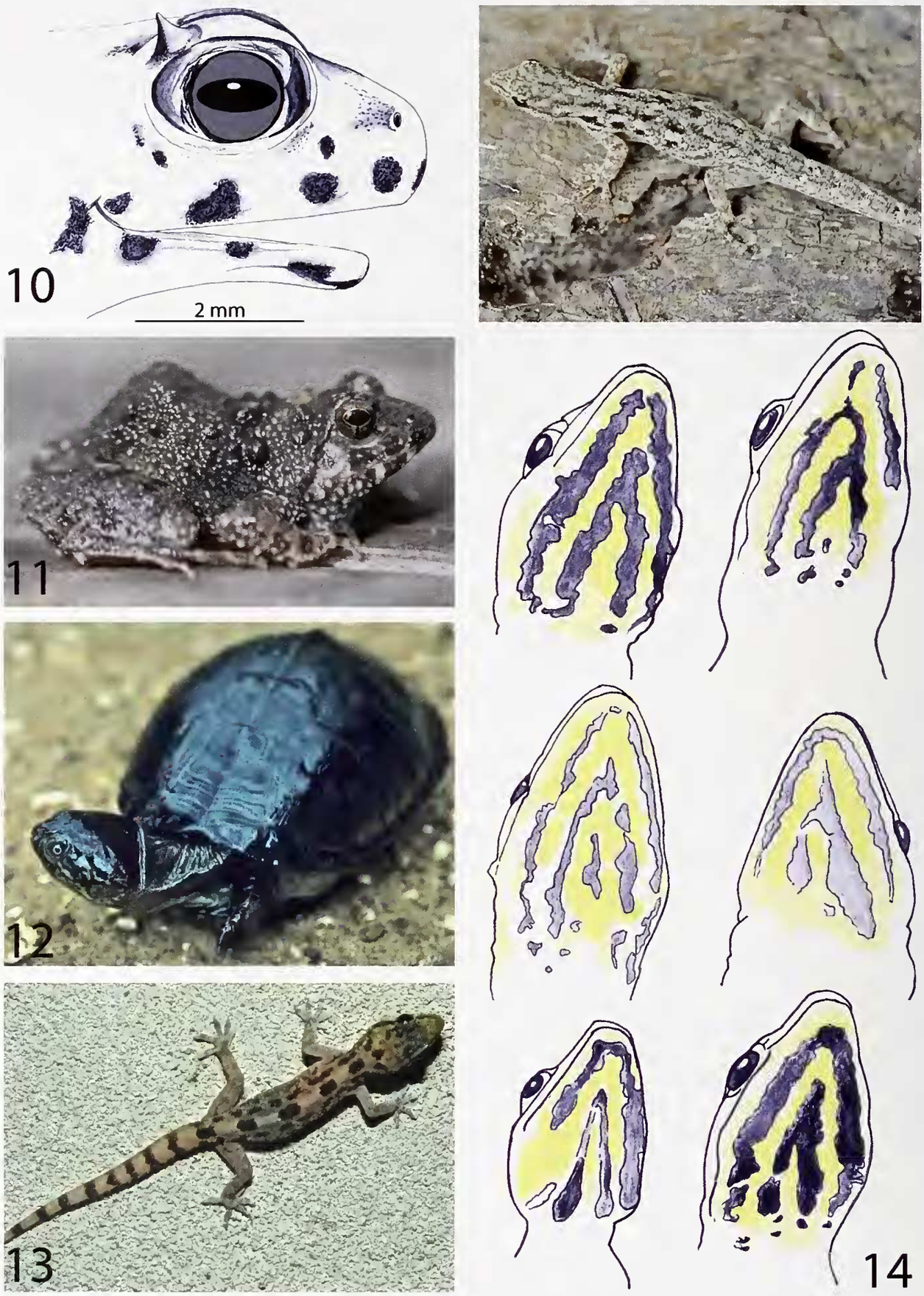
***Ptychadena pumilio* (Boulenger, 1920)**

Common name.– Little Rocket Frog.

Specimens examined.– One, ZFMK 58290: male, Orango Isl., 14.VI.1994.

Distribution.– The single specimen collected represents the first record from Guinea-Bissau.

Remarks.– The voucher specimen was trapped in a well together with *Leptopelis bufonides*, *Ptychadena maccarthyensis*, and *Phrynobatrachus francisci*. The well was surrounded by grass savanna, and according to Rödel (1995) and Schiøtz (1999) all four species inhabit savanna. The onset of the wet season initiated the first activities of *P. pumilio*. For detailed habitat descriptions see *Leptopelis bufonides*. Descriptions of 31 specimens collected on the mainland, published by Manaças (1949), do not allow unequivocal species identification. Referring to the description of the lateral position of the vocal sac by Manaças (1949), *Ptychadena* [*bibroni*] *arnei* is probably the species involved, however future examinations of that collection may prove to be helpful.



Figs 10–14. **10.** *Phrynobatrachus calcaratus*, Bubaque Isl.; **11.** *Phrynobatrachus francisci*, Orango Isl.; **12.** *Pelusios castaneus*, Bubaque Isl.; **13.** *Hemidactylus angulatus*, Orango Isl., **14.** *Lygodactylus gutturalis* (above), Soga Isl. (below, throat pattern of male individuals).

TESTUDINES

Cheloniidae

***Caretta caretta* (Linnaeus, 1758)**

Common names.– Loggerhead Turtle; P: Tartaruga caretta.
Distribution.– The species was observed throughout the entire archipelago (Limoges 1989)
Remarks.– To date, however, nesting sites have never been recorded from the archipelago; the species is very rare and only one more record in 2003 provides evidence of the species roaming around the islands (Catry et al. 2009).

***Chelonia mydas* (Linnaeus, 1758)**

Common names.– Green Turtle; P: Tartaruga verde; C: Tartaruga preto; B: Entchunko (Orango Isl.).
Distribution.– This is the most common marine turtle species of the archipelago (Limoges 1989, Limoges & Robillard 1991b).
Remarks.– Major nesting sites are located on the islands of Poilão, Amegue, Meio, Cavalos, Joäo Vieira, Adonga, Orango and Porcos (Fortes et al. 1998).

***Eretmochelys imbricata* (Linnaeus, 1766)**

Common names.– Hawksbill; P: Tartaruga verdadeira; C: Tartaruga vermelho; B: Djassaka (Orango Isl.).
Distribution.– The species was observed in the entire archipelago (Limoges 1989).
Remarks.– Nesting sites were found on Adonga Island (Limoges 1989), and the species has been observed on the main beaches of Poilao Isl., Unhocom and Porcos Isl.

***Lepidochelys olivacea* (Eschscholtz, 1829)**

Common names.– Olive Ridley Turtle; P: Tartaruga de ridley; B: Emvara (Orango Isl.).
Distribution.– The species was observed throughout the entire archipelago (Limoges & Robillard 1991b).
Remarks.– Major nesting sites are located on Orango Isl., lesser nesting activity occurs on Adonga and Poiläo Island (Limoges & Robillard 1991b).

Dermochelyidae

***Dermochelys coriacea* (Vandelli, 1761)**

Common names.– Leatherback Turtle; P: Tartaruga de couro; C: Tartaruga gigante; B: Djunumémé.
Distribution.– The species occurs throughout the archipelago (Limoges & Robillard 1991b).
Remarks.– Egg deposition was observed on the islands of Orango, Joäo Vieira and Unhocomo (Limoges & Robillard 1991b).

Pelomedusidae

***Pelusios castaneus* (Schweigger, 1812)**

Common names.– East African Black Mud Turtle; P: Tartaruga aquática, Cagado preto; C: Tartaruga de agua doce; B: Epototo (Bubaque, Canhabaque), Nun-é (Galinhas, Formosa, Caravela), Iun-é (Orango).
Specimens examined.– Seven, ZFMK 60762–63, plus five uncatalogued live specimens (vouchers lost): Bubaque Isl., Orango Isl., 21.VI.1994, 11./13.VII.1994, 6.VIII.1994.
Distribution.– Monard (1940b) recorded the species first from the mainland. Limoges (1989) and Limoges & Robillard (1991b) first report *P. castaneus* (as *P. subniger*) from the islands Enu and Joäo Vieira Isl. and larger islands.
Remarks.– Specimens were collected in secondary forests with temporary water bodies "lagunas"'. One specimen was found inside a watering tank. During the wet season (mid July to August), adult specimens could be observed in larger, permanent ponds. Next to the water line more individuals were found hidden beneath the grass. Hatchlings and juveniles were examined and released on 6.VIII.1994 (Fig. 12). Carcasses of *P. castaneus* were found near water bodies. Commonly observed Palm-nut Vultures (*Gyphohierax angolensis*) may represent one potential predator.

SAURIA

Amphisbaenidae

***Cynisca feae* (Boulenger, 1906)**

Distribution.– The species was recorded from Bubaque Isl. (Gans 1987). On the mainland recorded from Rio Cacine, Bissau, Ponta de Marques, Bissalanca (Boulenger 1905, Manaças 1955).

Gekkonidae

***Hemidactylus angulatus* Hallowell, 1854**

Common names.– West African House Gecko; P: Osga de brook; C: Oziga.
Specimens examined.– Twelve, ZFMK 58299–300: juveniles, Bubaque Isl., 17.VII.– 9.VIII.1994. ZFMK 58301: Eticoga (Orango Isl.), 18.VI.1994. ZFMK 58302: Soga Isl., 10.VII.1994.
Distribution.– Bocage (1896a) reported this gecko first from Bissau and Bolama Isl. A collection made by L. Fea published by Boulenger (1905) again included material from Bolama Isl., Ferreira (1902) mentions Geba, Monard (1940b) from Ponte Robalo, Mansoa, Sama, Pitche, Madina Boé and Catio and Manaças (1951b) additionally from Ponta de Marques, Bissalanca and Cacine. This study records the species from the Bijagós islands, Orango, Bubaque, and Soga for the first time.
Remarks.– All specimens were collected on house walls and juveniles were commonly observed isolated from adults (Fig. 13). Under captive conditions on Bubaque Isl. cannibalism was observed.

***Lygodactylus gutturalis* (Bocage, 1873)**

Common names.– West African Dwarf Gecko; P: Oziga; C: Lagarticha; B: Dongat.
Specimens examined.– Six, ZFMK 58293–94: Eticoga

(Orango Isl.), 18.VI.1994. ZFMK 58295–96: Imbone Isl., 8.VIII.1994. ZFMK 58297: Soga Isl., 19.VII.1994. ZFMK 58298: Bubaque Isl., 16.VI.1994.
Distribution.– Loveridge (1947) recorded the species first from Bolama Isl. and therefore the series reported here presents the second record from the archipelago. *L. gutturalis* was described from the mainland (Nogueira) and was later also recorded from Contubo-el, Madina Boé and Pitche (Monard 1940b).
Remarks.– Specimens were found in a variety of arboreal habitats e.g., *Acacia, Anacardium* and *Elaiës* as well as in *Ficus* spp. in gardens, but also in human settlements on roofs and fences. Specimens can be individually identified by their throat patterns (Fig. 14). The species was usually observed active from afternoon to sunset, occasionally also at noon. The Grey-headed Kingfisher (*Halcyon leucocephala*) preyed on this gecko. Other potential predators among the kingfishers include *Halycon senegalensis* and *Alcedo cristata*. In addition, a captive held *Chamaeleo gracilis* on Bubaque Isl. was observed preying on *L. gutturalis*.

Agamidae
***Agama picticanda* Peters, 1877**
Common names.– West African agama; C: Lagarticha.
Specimens examined.– Two, ZFMK 58314–15: Bubaque Isl., 20.VII.1994.
Distribution.– Bocage (1896a) first recorded this species from Guinea-Bissau. Later, Manaças (1950) recorded *A. agama* from Formosa Isl., whereas Naurois (1969) found the species on Bubaque Isl. During his study, *A. agama* was recorded from the islands Uno, Bubaque and Soga.
Remarks.– We follow the taxonomic concept for *Agama agama* published by Wagner et al (2009) who restricted *A. agama* to Central Africa. Therefore the western populations bear the nomen *Agama picticanda*. This species was more abundant in coastal areas, in ruines, but also on *Ficus* or *Mangifera* trees (Fig. 15). On one occasion the species was observed in a *Avicennia* tree, which at high tide was at the waterline. The species was never recorded in treeless areas. Gravid and egg-laying females were observed at the end of July.

Chamaeleonidae
***Chamaeleo gracilis gracilis* Hallowell, 1842**
Common names.– Graceful Chameleon; P: Camaleäo; B: Nhanguti (Balanta).
Specimens examined.– Two, ZFMK 58312–13: females, Eticoga (Orango Isl.), 17./21.VI.1994.
Distribution.– The species was first recorded from Guinea-Bissau by Bocage (1896a). Boulenger (1905) recorded the species from Bolama Isl., the first record from the island group. Limoges & Robillard (1991b) only mentioned *C. senegalensis* from the archipelago, however; presumably both species are represented in their collection. During this study this species was recorded from Orango Isl.
Remarks.– Specimens were only recorded in savannah-like habitats with single trees providing shelter. One specimen was collected on the beach, 3 m from coastal shrubs (Fig. 16). On 24.VI.1994 copulation was observed in captivity on Bubaque Isl.

***Chamaeleo senegalensis* Daudin, 1802**
Common names.– Senegal Chameleon; P: Camaleäo do Senegal; C: Camaleäo.
Distribution.– On the mainland this chameleon was recorded from Rio Cacine (Boulenger 1905), Ponte Robalo, Mansoa, Contubo-el, Pitché, Catio, Cacheu (Monard 1940b); Bijimita, Bissoram, Mansoa (Manaças 1951b); there is one record from Caravela Island (Limoges & Robillard 1991b).
Remarks.– The species is considered to be rare, however it also occurs on other islands (Limoges & Robillard 1991b).

Scincidae
***Trachylepis affinis* (Gray, 1838)**
Common names.– Senegal Mabuya; C: Lagarticha; B: Dongat.
Specimens examined.– Three, ZFMK 58305–06: Bubaque Isl., 25./29.VI.1994. ZFMK 58307: Eticoga (Orango Isl.), 18.VI.1994.
Distribution.– Bocage (1896a) recorded this species first from Guinea-Bissau, Boulenger (1905) recorded it from Bolama Isl. and Naurois (1969) from Bubaque Isl.
Remarks.– The species was observed in shaded and densely vegetated habitats with shrubs and mango trees. *T. affinis* was also observed foraging in the litoral zone (Fig. 17).

***Trachylepis perrotetii* (Duméril & Bibron, 1839)**
Common names.– Teita Mabuya; C: Lagarticha; B: Dongat.
Specimens examined.– Two, ZFMK 58303: Soga Isl., 14.VII.1994. ZFMK 58304: Bubaque Isl., 8.VII.1994.
Distribution.– Initially, Bocage (1872) recorded this scincid from Guinea-Bissau and the same author (Bocage 1896a) provided the Bolama record. In this study *T. perrotetii* was first recorded from the islands Bubaque and Soga.
Remarks.– The species utilizes exposed structures e.g., termite mounds or logs in various forested habitats such as remnants of virgin humid and drier forests, forest edge habitats, secondary forests aswell as gardens and vegetated roadsides.

Varanidae
***Varanus exanthematicus* (Bosc, 1792)**
Common names.– Savannah Monitor; P: Linguana de mato; C: Cutô; B: Cagueda (Bubaque, Canhabaque, Formo-

sa, Orango), Cagada (Caravela), Caguedje (Galinhas).
Distribution.– On the mainland this monitor lizard was recorded from Bissau and nearby Bolama Isl. (Bocage 1896a; Boulenger 1905), on Buba (Ferreira 1902) and Bissalanca, Canchungo, Pecixe and Pitche (Manaças 1955). The species occurs on several islands of the archipelago (Limoges & Robillard 1991b). Although the authors do not mention specific islands, several local island names of this species are available (see above).
Remarks.– This species is less common than *V. niloticus* (Limoges & Robillard 1991b).

***Varanus niloticus* (Linnaeus, 1758)**
Common names.– Nile Monitor; P: Linguana de agua; C: Linguana; B: Cagueda, Caguedje, Cagada.
Specimens examined.– Five, ZFMK 58308–09: Eticoga (Orango Isl.), 12.VI.1994; ZFMK 58310: Soga Isl., 14.VII.1994. One uncatalogued live specimen, Bubaque Isl., 2.VIII.1994; 1 uncatalogued live specimen Bissau, 10.VIII. 1994.
Distribution.– *V. niloticus* was first recorded from Guinea-Bissau by Bocage (1896a). Manaças (1955) noted the species from Formosa Isl., the first record from the archipelago. Naurois (1969) reported *V. niloticus* from Bubaque Isl. Limoges (1989) also mentioned Varela Isl. and Limoges & Robillard (1991b) indicated that the species inhabits the entire archipelago including smaller islands.
Remarks.– The species was only found in coastal areas. Adult specimens were observed in densely vegetated steeper slopes near the coast. Juveniles were observed next to a freshwater pond (Fig. 18). In 1993, one juvenile was observed in a saltwater pond. Locals consume both, the eggs and the animals.

SERPENTES

Colubridae

***Philothamnus heterodermus* (Hallowell, 1857)**
Common name.– Variable Green Snake
Specimens examined.– One, ZFMK 58332: Orango Isl., 13.VI.1994
Distribution.– Monard (1940b) reported the species first from Guinea-Bissau. This voucher is the first record from the archipelago and represents the westernmost range of the species.
Remarks.– The specimen was found dead next to a path in a dense stretch of coastal forest.

***Thelothornis kirtlandii* (Hallowell, 1844)**
Common name.– Forest Vine Snake.
Specimens examined.– One, ZFMK 60764: Bubaque Isl., 27.VII.1994.
Distribution.– This voucher documents the first record of the species from the archipelago (cf. Riquier & Böhme 1996) (Fig. 19); Loveridge (1944) indicated only "Portuguese Guinea". .
Remarks.– The specimen was detected at a height of 3–4 m in a *Mangifera* tree surrounded by secondary forest. An alerted sunbird (*Cinnyris* cf. *cupreus*) indicated the presence of the snake, which was approaching the sunbird's nest.

***Thrasops occidentalis* Parker, 1940**
Common name.– Western Black Tree Snake
Specimens examined.– One, ZFMK 58331: Bubaque Isl., 12.VIII.1994.
Distribution.– This record is the first from the archipelago and Guinea-Bissau and presents the northwesternmost locality within the species range (Fig. 20).
Remarks.– The voucher was killed by locals in a traditional village with mud huts interspersed with shrubs. The first third of specimen shows light brown lateral bands on both sides, and the anal scale is entire.

***Toxicodryas blandingii* (Hallowell, 1844)**
Common names.– Blanding's Tree Snake
Specimens examined.– One, ZFMK 61093: Bubaque Isl., 4.VIII.1994.
Distribution.– This snake has been documented from Bolama Isl. (Bocage 1896a, b) and Bissau (Manaças 1955). The Bubaque Isl. voucher specimen represents the first record from the archipelago (Fig. 21). In addition, one specimen was observed on Soga Isl.
Remarks.– The voucher specimen was found during a night survey on the roadside amid dense shrubs of secondary bush and palm vegetation. The specimen from Soga Isl. was observed in an oil palm at a height of approximately 8 m. The taxonomic status of the species remains unresolved; the species is also treated in the genus *Boiga* (e.g. Pauwels & Vande weghe 2008).

Elapidae

***Dendroaspis viridis* (Hallowell, 1844)**
Common names.– Western Green Mamba; P: Cobra verde de palmeira; C: Cacôba; B: Ianne (Orango Isl.), Edjanro (Caravela Isl.).
Distribution.– Naurois (1969) recorded this species from Bubaque Isl., Manaças (1981) further mentions Bolama Isl., whereas Limoges & Robillard (1991b) indicate that the species occurred on all larger islands.
Remarks.– According to Limoges & Robillard (1991b) the species is particularly associated with raffia palms (*Raphia exica*) commonly dominant in swamp forests.

***Elapsoidea semiannulata moebinsi* (Werner, 1897)**
Common names.– Angolan Garter Snake
Distribution.– On the islands this species has only been reported from Bubaque Isl. (Naurois 1969). Manaças (1981) provided a second record from Bubaque Isl.

Figs 15–22. **15.** *Agama picticauda*, left male, right female; **16.** *Chamaeleo gracilis*, Orango Isl.; **17.** *Trachylepis affinis*, Bubaque Isl.; **18.** juv. *Varanus niloticus*, Bubaque Isl.; **19.** *Thelotornis kirtlandii*, Bubaque Isl.; **20.** *Thrasops occidentalis*, Bubaque Isl.; **21.** *Toxicodryas blandingii*, Bubaque Isl.; **22.** *Naja melanoleuca*, Bubaque Isl.

Loveridge (1944) indicates mainland locations in Bissau and Rio Cacine.
Remarks.– Voucher specimens are deposited in the collections of the Muséum nationale d'Histoire Naturelle de Paris (MNHN 1965–463). Loveridge (1944) lists the species as *Elapsoidea sundevalli güntherii*.

***Naja melanoleuca* Hallowell, 1857**
Common names.– Forest Cobra; C: Bida; B: Cadjipón.
Specimens examined.– One, ZFMK 58329: Bubaque Isl., 1.VII.1994.
Distribution.– The first record from Guinea-Bissau was provided by Monard (1940b), and this voucher is the first record from the archipelago (Fig. 22). A second specimen was observed on Orango Isl.
Remarks.– The voucher specimen was found at midday in a depression surrounded by slopes with dense vegetation. A second specimen was observed in a palm forest with dense scrub.

***Naja nigricollis nigricollis* Reinhardt, 1843**
Common names.– Black-necked Spitting Cobra; P: Cuspideira; C: Vida; B: Cadjipón
Specimens examined.– One, ZFMK 58330: Bubaque Isl., 2.VIII.1994.
Distribution.– Bocage (1896a) documented the first record from Bolama Isl., and Manaças (1981) added Bissau and Buba. Limoges & Robillard (1991b) first record the species far off the mainland on the archipelago.
Remarks.– The voucher was killed around midday by locals in secondary bushland on a densely vegetated slope near the coast (Fig. 23).

Lamprophiidae
***Boaedon fuliginosus* (Boie, 1827)**
Common name.– Brown House Snake
Distribution.– Boulenger (1905) reports the species on the mainland from Cacine, Manaças (1955) from Bissau, Bissalanca and Bijimita. The only record from the archipelago is provided by Naurois (1969) who reports the species was collected 1962 from Bubaque Isl.
Remarks.– Hallermann & Schmitz (2007) indicated that the "*Lamprophis fuliginosus*" complex includes several cryptic species. Most recent taxonomic research suggests the resurrection of the generic name *Boaedon* Duméril, Bibron & Duméril, 1854 for the widely distributed *fuliginosus* complex (Kelly et al. 2011), a view which is followed herein.

***Psammophis phillipsi* (Hallowell, 1844)**
Common names.– Phillip's Sand Snake; P: Cobra amonton.
Specimens examined.– Five, ZFMK 58316–17: Bubaque Isl., 26./27. VI. 1994. ZFMK 58318: Bubaque Isl. 20.VII. 1994. ZFMK 58319: Bubaque Isl., 15.VII. 1994. ZFMK 58320: Bubaque Isl., 2. VIII. 1994.
Distribution.– Naurois (1969) reported the species from Uno Island. This study recorded the species based on vouchers from Bubaque Isl. (Fig. 24) and one specimen was observed on Soga Isl.
Remarks.– The species was recorded during daytime in secondary bushland interspersed with *E. guineensis*, in agroecosystems and home gardens. Two specimens were observed preying on a female *Agama picticauda* and *Trachylepis affinis*. Both species have been found to represent the most common prey items of *P. phillipsi* (Akani et al. 2003).

Pythonidae
***Python sebae* (Gmelin, 1789)**
Common names.– Northern African Python; P: Gibóia; C: Irä Cego; B: Emeno, Emeni (Orango Isl.).
Specimens examined.– Four, ZFMK 58333: Soga Isl., 14.VII.1994. Three uncatalogued live specimens, Bubaque Isl., 13./14./23.VII.1994 (Fig 25).
Distribution.– Bocage (1896a) was the first to record *P. sebae* from Guinea-Bissau while Naurois (1969) first reported the species from the archipelago, without providing any specific locality. Limoges & Robillard (1991b) indicated that this species ranges on all larger and some smaller islands. In this study the species is documented by vouchers from Soga Isl. and Bubaque Isl., one skin owned by locals on Orango Isl. was observed and a skeleton including a jawbone was found on Imbone Island.
Remarks.– Limoges & Robillard (1991b) recorded the snake from agroecosystems, salt marshes and mangrove swamps, usually near water bodies. Voucher specimens were collected in secondary bushland, rice fields and near mangrove swamps. Limoges & Robillard (1991b) reported *P. sebae* as a predator of bird colonies, also on very small islands. This may prove that the species is capable of crossing greater marine passages between the islands. According to locals, domestic fowl and livestock also represent prey items of *P. sebae*. In one event, a python devoured a sleeping child in a hut (IUCN staff, pers. comm.). *P. sebae* is always killed by locals if it enters a village. The meat is consumed, and it is believed that it heals leprosy. Skins are sold in local markets.

Viperidae
***Bitis arietans arietans* Merrem, 1820**
Common names.– Puff Adder; P: Surucucu; C: Tutu; B: Evé-vé.
Specimens examined.– Two, ZFMK 58327: Soga Isl., 15.VII.1994. ZFMK 58328: Bubaque Isl., 17.VII.1994.
Distribution.– Bocage (1896a) documented the species first from Bolama Island. Limoges & Robillard (1991b) reported the species from the archipelago, but did not pro-

Figs 23–31. **23.** *Naja n. nigricollis*, Bubaque Isl.; **24.** *Psammophis phillipsi*, Bubaque Isl.; **25.** *Python sebae*, Bubaque Isl.; **26.** *Bitis a. arietans*, Soga Isl. ; **27.** juv. *Crocodylus suchus*, Bissau Zoo; **28.** *Latastia ornata*, Bafatà, mainland ; **29.** *Tarentola ephippiata senegambiae*, Mansoa, mainland; **30.** *Lycophidion albomaculatum*, Bissau; **31.** *Python regius*, Bissau.

Table 2. Colour morphs of six live *Hyperolius occidentalis*.

Specimens	No. 1	No. 2	No.3	No.4	No.5	No.6
Locality		Orango	Bubaque	Bubaque	Bubaque	Bubaque
Sex	Female?	Female?	Male	Male	Male	Male?
SVL (mm)	33	30–32	28–29	30	28–29	25
Throat	Yellow	Yellow	Intense yellow	Yellow	Dark yellow	–
Belly	Yellow small yellow	White with with white mark mark	Light yellow in the centre	Yellow	Yellow	Yellow
Fore limbs	Interior light yellow	–	–	Only pigmented above, interior yellow	Joints without pigmentation	–
Fingers	1 and 2 yellow	–	1 and 2 yellow less pigmented,	1 and 2 light yellow	– including	1 and 2 yellow the web
Discs / fingers	–	–	–	–	1 not pigmented, yellow, 2 slightly pigmented dark yellow, 3 and 4 pigmented	–
Hind limbs (concerning orange/red parts)	Backside of thighs	Underside of thighs also with scarce yellowish pigmentation	Inside and outside of thighs, underside of tarsus	Posterior, interior and underside of thigs. femur, tibia, and tarsus yellow inside, towards anus yellowish mottled	Upper side of thigh framed with red spot and dark pigmented, outside of thigh with 3x larger red mark compared to upper side	Upper side of thigh slightly pigmented, underside of tarsus (1, 2, and 3 toe), underside of thighs with larger yellowish mottling
Toes	1, 2 and 3 are red including the corresponding webbing	–	–	1, 2 and 3 less pigmented, little reddish and whitish	in front of 3 toe red mark	1, 2 and 3 including the webbing red, 4 and 5 pigmented
Discs / toes	red, 4 and 5 more pigmented, dark red	–	4 reddish	–	all dark, 1, 2, and 3 lighter red	all red
Dorsal-lateral line/stripe	–	–	–	Distinctly pronounced	Distinctly pronounced	Scarcely pronounced

vide explicit locality records. Garcia (1991) provided a first record from Bubaque Island. In this study, *B. arietans* was recorded from the islands Soga and Bubaque.
Remarks.– Specimens from both islands Orango and Bubaque were detected in savannah-like habitats periodically altered through slash-and-burn farming practises. On Soga Isl. a dead juvenile specimen was found in dense secondary bush and palm forest (Fig. 26).

***Bitis nasicornis* (Shaw, 1802)**
Common names.– Rhinoceros Viper; P: Vibora cornuda
Distribution.– Apparently only known from Bubaque Isl., where a juvenile and adult have been recorded (Naurois 1969)
Remarks.– Manaças (1981) indicates that Schmidt (1933) provides a quote by Boulenger, who states that the species occurs in Guinea-Bissau. This viper occurs in diverse

ecosystems from lowland savannah to high altitude forested ecosystems (Angel et al. 1954).

Crocodylidae

***Crocodylus suchus* Geoffroy, 1807**

Specimens examined.– One, ZFMK 58334: dead juv., Bissau Zoo (Fig 27).

Distribution.– A first record from Bolama Isl. is provided by Bocage (1896b). Populations are recorded from the islands Orango, Formosa, Imbone and Uno (Limoges & Robillard 1991a, b).

Remarks.– Limoges & Robillard (1991b) reported an increase of populations from the islands mentioned above. West and central African populations proved to have high genetic divergence from eastern populations of the Nile Crocodile (Schmitz et al. 2003).

***Osteolaemus tetraspis tetraspis* Cope, 1861**

Common names.– Dwarf Crocodile; P: Crocodilo anão; C: Lagarto preto; B: Eneguebe (Bubaque, Canhabaque), Etchega (Galinhas, Formosa), Eod (Orango), Equetch (Caravela).

Distribution.– Bocage (1867) reports one specimen from Bissau. Waitkuwait (1985) could not provide any locality records from Guinea-Bissau, however, according to Méthot (1989, in litt. Limoges 1989) remnant populations probably occur on the islands Formosa and Orango.

Remarks.– Similarly as in *C. suchus* Limoges & Robillard (1991b) reported an increase of populations from Orango Island.

DISCUSSION

Available reports on amphibians or reptiles recorded in Guinea-Bissau are scarce. Preliminary studies go back to Bocage (1866, 1867, 1872, 1873, 1888, 1896a, b), Monard (1940a, b) and Manaças (1947, 1949, 1950, 1951a). Other reports provide more general data of the entire vertebrate fauna as well as essays on the herpetofauna (e.g., Frade 1950; Naurois 1969; Limoges 1989; Limoges & Robillard 1991a, b). Latest herpetological published records mainly refer to sea turtles, in particular to *Chelonia mydas* (Catry et al. 2002; Fortes et al. 1998; Godley et al. 2003).

The present study demonstrates that at least 13 amphibian species occur on four of the main Bijagós islands, ten of these represent first records for the country. Therefore, a total of 25 amphibian species are now known from Guinea-Bissau (App. 1). Five marine turtle species and 26 reptile species (including two crocodilians) occur on the archipelago. Alike amphibians, reptile diversity is clearly lower on the islands compared to the mainland (App. 1). However, the present study has clear limits and most likely covers only parts of the herpetofauna of the islands.

The phenomen of lower species richness on the islands was also recognized by other authors (e.g., Mertens 1964) and may relate to the islands distinctly smaller land surfaces, isolation from the mainland, lacking elevated ecosystems and freshwater wetlands or it is correlated with forest cover, habitat diversity and rainfall (Leaché et al. 2006, Rödel et al. 2008). The differences in species richness are more distinct in amphibians, and naturally dispersed colonization is more restricted although possible via rafting and potentially with birds (egg clusters stick to feathers) (cf. Measey et al. 2007; Queiroz 2005), and with few species i.e. *Ptychadena mascareniensis* indicating a certain tolerance to salinity (Vences et al. 2004). However, the translocation of amphibians through humans appears to be the most common mechanism of dispersal for species roaming oceanic islands (Vences et al. 2003).

The vegetation of the Bijagós archipelago comprises both, Guinean/Congolian and Sudano-Sahel elements, which is reflected in its herpetofauna. Typical savannah species (e.g., *Hemisus guineensis, Trachylepis perroteti* and *Bitis arietans*) are recorded from the islands as well as typical rainforest dwellers (*Silurana tropicalis, Bitis nasicornis* and *Thelotornis kirtlandii*). In some species, e.g., *Kassina senegalensis* and *Thrasops occidentalis* differences in morphology between island and mainland populations have been recognized and further research is necessary to clarify the taxonomic status of these island populations. Also, the *Hyperolius* sp. may represent an endemic species. This is important as the islands are impacted by various threats, in particular by illegal logging for commercial timber and slash-and-burn shifting agriculture and therefore many species could be threatened before they become known to science.

Acknowledgements. We are grateful to the following people: U. Bott prepared the map to illustrate the archipelago; E. Fischer provided relevant references and identified herbarized plant material. The "Muséum National d'Histoire Naturelle" in Paris provided voucher specimens. Many thanks to P. Campredon, C. Cassama, G. da Costa, L. Gündling, P. K. Mendy, R. Miranda, B. Paris, J.-Y. Pirot A. Rachid, for the logistical and bureaucratic support. The following people provided valuable or rare literature: P. Catry, E. Crespo, F. Reiner and S. Trape. During both trips N. Riquier provided enormous stamina, patience and indispensable assistance – a very special thanks to her.

REFERENCES

Adalsteinsson SA, Branch WR, Trape S, Vitt LJ, Hedges SB (2009) Molecular phylogeny, classification, and biogeography of snakes of the Family Leptotyphlopidae (Reptilia, Squamata). Zootaxa 2244: 1–50

Akani GC, Eniang EA, Ekpo IJ, Angeleci FM, Luiselli L (2003) Food Habits of the Snake *Psammophis phillipsi* from the Continuous Rain-Forest Region of Southern Nigeria (West Africa). Journal of Herpetology 37: 208–211

Amiet JL (2004) A propos de deux *Leptopelis* nouveaux pour la faune du Cameroun (Anura, Hyperoliidae). Alytes 21: 111–170

Andersson L (1937) Reptiles and Batrachiens. Collected in the Gambia by Gustav Svensson and Birger Rudebeck (Swedish Expedition 1931). Arkiv För Zoologi 29A (16): 1–28

Andreone F, Channing A, Drewes R, Gerlach J, Glaw F, Howell K, Largen M, Loader S, Lötters S, Minter L, Pickersgill M, Raxworthy C, Rödel M-O, Schiotz A, Vallan D, Vences M (2008) Amphibians of the Afrotropical Realm Pp. 53–58. In: Stuart S, Hoffmann M, Chanson J, Cox N, Berridge R, Ramani P, Young B (eds) Threatened Amphibians of the World. Lynx Editicions, Barcelona, Spain. IUCN, Gland, Switzerland; and Conservation International, Arlington, Virginia, USA, 758 pp.

Angel F (1944) Un lézard nouveau du Mont Nimba (Haute Guinée française) appartenant au genre *Lygosoma* (Matériaux de la mission Lamotte au Mont Nimba en 1942). Bulletin du Muséum national d'Histoire naturelle (2ème sér.) 16: 293–294

Angel F, Guibé J, Lamotte M, Roy R (1954) La Réserve Naturelle Intégrale du Mont Nimba. Mémoires de l'Institut Français d'Afrique Noire, Dakar 40: 381–400

Arnoult J, Lamotte M (1968) Les Pipidae de l'Ouest africain et du Cameroun. Bulletin de l'Institut Fondamental d'Afrique Noire (I.F.A.N.), T. X.X.X., sér. A 30(1): 270–306

Barnett LK, Emms C, Santoni C (2001) The herpetofauna of Abuko Nature Reserve, The Gambia. Herpetological Bulletin. 77: 5–14

Bocage JVB du (1866) Lista dos reptis das possessões portuguezas d'Africa occidental que existem no Museu de Lisboa. Jornal de Sciencias Mathematicas, Physicas e Naturaes, Academia Real das Sciencias de Lisboa I: 37–56

Bocage JVB du (1867) IV. Zoologia – 1. Segunda lista dos reptis das possessões d »Africa occidental que existem no Museu de Lisboa. Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 1: 217–228

Bocage JVB du (1872) Diagnoses de quelques espèces de reptiles d'Afrique occidentale. Jornal de Sciencias Mathematicas, Physicas e Naturaes, Academia Real das Sciencias de Lisboa IV: 72–82

Bocage JVB du (1873) Mélanges erpétologiques. II. Sur quelques reptiles et batraciens nouveaux, rares ou peu connus d'Afrique occidentale. Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 4: 209–227

Bocage JVB du (1888) Mélanges erpétologiques IV – Espèces du genre *Dendraspis*. Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 138–147

Bocage JVB du (1896a) Reptis de Algumas Possessões Portuguezas D'Africa que Existem no Museu de Lisboa. Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 14: 65–104

Bocage JVB du (1896b): Reptis de Bolama, Guiné portugueza, colligidos pelo sr. Costa Martins, chefe interino de daude no archipelago de Cabo-Verde. Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 176–178

Boesl M (1995) Zur Herpetofauna einer westafrikanischen Inselgruppe (Bijagós-Archipel, Guinea-Bissau): Taxonomie, Zoogeographie und Ethoökologie. Unpublished diploma thesis, University of Bonn, 222 pp.

Böhme W (1978) Zur Herpetofaunistik des Senegal. Bonner zoologische Beiträge 29: 360–417

Böhme W (1993) Mission d'études herpétologiques dans les forêts de Ziama et Diéké Guinée forestière. Projet de Gestion des Resources Forestieres (PROGERFOR) Expert en Conservation de la Nature. Deutsch Forst consult, Neu-Isenburg, 49 pp.

Böhme W (1994a) Frösche und Skinke aus dem Regenwaldgebiet Südost-Guineas, Westafrika. I. Einleitung; Pipidae, Arthroleptidae, Bufonidae. herpetofauna 16: 11–19

Böhme W (1994b) Frösche und Skinke aus dem Regenwaldgebiet Südost-Guineas, Westafrika. II. Ranidae, Hyperoliidae, Scincidae; faunistisch-ökologische Bewertung. herpetofauna 16: 7–16

Boulenger GA (1905) Report on the Reptiles collected by the late L. Fea in West Africa. Annali del Museo Civico di Storia Naturale di Genova 3: 196–216

Branch B (1988) Field Guide to the Snakes and other Reptiles of Southern Africa. Struik Publ. Cape Town, 328 pp.

Broadley DG (1966) A Review of the genus *Natriciteres* Loveridge (Serpentes: Colubridae). Arnoldia (Rhodesia) 2: 1–11

Broadley DG (1971) A Revision of the African Snake Genera *Amblyodipsas* and *Xenocalamus*. Occasional papers of the National Museums of Rhodesia 4: 629–697

Broadley DG (1980) A revision of the African snake genus *Prosymna* Gray (Colubridae). Occasional papers of the National Museums of Rhodesia 6: 481–556

Broadley DG (1981) A review of the genus *Pelusios* Wagler in Southern Africa (Pleurodira: Pelomedusidae). Occasional papers of the National Museums of Rhodesia, Series B Natural Sciences 6 (9): 633–686

Broadley DG (1984) A review of geographical Variation in the African Python, *Python sebae* (Gmelin). British Journal of Herpetology 6: 359–367

Broadley DG, Wallach V (2009) A review of the eastern and southern African blind-snakes (Serpentes: Typhlopidae), excluding *Letheobia* Cope, with the description of two new genera and a new species. Zootaxa 2255: 1–100

Buckley LB, Jetz W (2006) Environmental and historical constraints on global patterns of amphibian richness. Proceedings of the Royal Society. doi:10.1098/rspb.2006.0436

Buffrenil de V (1993) Statut et Conservation des Crocodiles en Afrique : Statut et Repartition des Crocodiles en Guiné Bissau. BIODEV (Biodiversité et Developpement), Secret. CITES, Genève, Suisse: 84–90

Catry P, Barbosa C, Indjai B, Almeida A, Godley BJ, Vié J-C (2002) First census of the green turtle at Poilão, Bijago´s Archipelago, Guinea-Bissau: the most important nesting colony on the Atlantic coast of Africa. Oryx 36: 400–403

Catry P, Barbosa C, Paris B, Indjai B, Almeida A, Limoges B, Silva C, Pereira H (2009) Status, Ecology, and Conservation of Sea Turtles in Guinea-Bissau. Chelonian Conservation & Biology 8:150–160

Chabanaud P (1917) Énumération des reptiles non encore étudés de l'Afrique occidentale, appartenant aux collections du Muséum, avec la description des espèces nouvelles. Bulletin du Muséum national d'histoire naturelle, Paris 23: 83–105

Chabanaud P (1920) Contribution à l'étude de la faune herpétologique de l' Afrique Occidentale – Note préliminaire sur les résultats d'une mission scientifique en Guinée française (1919–1920). Bulletin du Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française, 1921: 389–497

Chabanaud P (1921) Contribution à l'étude de la faune herpétologique de l' Afrique Occidentale, 2 ième note. Bulletin du Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française, 1921: 445–472

Chippaux J-P (2006) Les Serpents d'Afrique occidentale et centrale. IRD (Inst. de Recherche pour le Developpement) Éditions, Collection Faune et Flore tropicales 35, Paris, 329 pp.

Cole MM (1986) The Savannas, Biogeography and Geobotany. Academic Press, London, 438 pp.

Ferreira JB (1902) Lista dos Reptis e Batrachios da Guiné da Collecçao do Sr. Newton (1900–1901). Jornal de Sciencias, Mathematicas, Physicas, e Naturaes 2, VI: 231–233

Fischer E, Hinkel H (1992) Natur Ruandas – Einführung in die Flora und Fauna Ruandas. Ministerium des Innern und für Sport, Mainz, 452 pp.

Frade F, Bacelar A, Gonçalves B (1946) Esboço ecológico da fauna da Guiné Portuguesa. Anais da Junta de Investigações Coloniais I: 321–342

Fortes O, Pires AJ, Bellini C (1998) Green Turtle, *Chelonia mydas* in the Island of Poilão, Bolama-Bijagós Archipelago, Guinea-Bissau, West Africa. Marine Turtle Newsletter 80: 8–10

Frade F (1950) Estudos, Ensaios e Documentos VIII – Notas de zoogeografia e de história das exploracões faunísticas da Guiné Portuguesa. Anais da Junta de Investigações Coloniais 8: 1–32

Frost DR (2011) Amphibian Species of the World: an Online Reference. Version 5.5 (31 January, 2011). http://research.amnh.org/herpetology/amphibia

Gans C (1987) Studies on Amphisbaenians (Reptilia). 7. The small round-headed species (*Cynisca*) from Western Africa. American Museum Novitates 2896: 1–84

Garcia FMRA (1991) Projecto de Manual Illustrado de Répteis e Ofidios da Guiné – Bissau. Unpublished Report

Gardete-Correira I (1971–73) Consideraçöcs zoogeográficas e ecológicas sobre os répteis de Cabo Verde, S. Tomé e Principe, Guiné, Angola e Moçambique. Relatório de estágio não publicado. Fac Ciéncias de Lisboa

Gilles S, Nago A, Grell O, Sinsin B, Rödel M-O (2006) The amphibian fauna of Pendjari National Park and surroundings, northern Benin. Salamandra 42: 93–108

Godley BJ, Almeida A, Barbosa C, Broderick AC, Catry PX, Hays GC, Indjai B (2003) Using satellitetelemetry to determine post-nesting migratory corridors and foraging grounds of green turtles nesting atPoilao, Guinea Bissau: Report to project donors. Unpublished Report, Marine Turtle Research Group, Schoolof Biological Sciences, University of Wales Swansea, Swansea SA2 8PP, UK

Grafe TU (1999) A function of synchronous chorusing and a novel female preference shift in an anuran. Proceedings of the Royal Society, London (B) 266: 2331–2336

Grandison AGC (1968) Nigerian Lizards of the genus *Agama* (Sauria: Agamidae). Bulletin of the Natural History Museum London (Zoology) 17(3): 3–90

Greenbaum E, Campbell AC, Raxworthy CJ (2006) A revision of sub-saharan *Chalcides* (Squamata: Scincidae) with redescriptions of two East African species. Herpetologica 62: 71–89

Gruschwitz M, Lenz S, Böhme W (1991) Zur Kenntnis der Herpetofauna von Gambia (Westafrika). herpetofauna 13: 13–34

Guibé J, Lamotte M (1957) Révision systématique des *Ptychadena* (Batraciens, Anoures, Ranidés) d'Afrique occidentale. Bulletin de l'Institut Fondamental d'Afrique Noire (I.F.A.N.), sér. A. 19: 937–1003

Guibé J, Lamotte M (1958a) La Réserve Naturelle Intégrale du Mont Nimba. XII. Batraciens (sauf *Arthroleptis, Phrynobatrachus* et *Hyperolius*). Mémoires de l'Institut Fondamental D'Afrique Noire 53: 241–273

Guibé J, Lamotte M (1958b) Morphologie et reproduction par développement direct d'un anoure du Mont Nimba, *Arthroleptis crnscnlum* Angel. Bulletin du Muséum National D'Histoire Naturelle 30 (2): 125–133

Guibé J, Lamotte M (1958c) Une espèce nouvelle de batracien du Mont Nimba (Guinée Française) appartenant au genre *Phrynobatraclus*: *Ph. maculiventris* n. sp.. Bulletin du Muséum National D'Histoire Naturelle 30 (3): 255–257

Guibé J, Lamotte M (1961) Deux espèces nouvelles de batraciens de l'ouest africain appartenant au genre *Phrynobatrachus*: *Ph. gnineensis* n.sp. et *Ph. alticola* n. sp.. Bulletin du Muséum National D'Histoire Naturelle 33 (6): 571–576

Guibé J, Lamotte M (1963) La Réserve Naturelle Intégrale du Mont Nimba. XXVIII. Batraciens du genre *Phrynobatrachus*. Mémoires de l'Institut Fondamental D'Afrique Noire 66: 601–627

Hahn DE, Wallach V (1998) Comments on the systematics of Old World *Leptotyphlops* (Serpentes: Leptotyphlopidae), with description of a new species. Hamadryad 23: 50–62

Håkansson NT (1981) An annotated checklist of reptiles known to occur in the Gambia. Journal of Herpetology 15: 155–161

Hallermann J, Roedel MO (1995) A new species of *Leptotyphlops* (Serpentes: Leptotyphlopidae) of the *longicaudus*-group from West Africa. Stuttgarter Beiträge zur Naturkunde, Ser. A. (Biol.) 532: 1–8

Hallermann J (2001) Bemerkenswerter Mageninhalt von *Mehelya stenophthalmus* (Mocquard, 1887) (Serpentes: Colubridae). Salamandra 37: 105–106

Hallermann J, Schmitz A (2007) First results on the taxonomy of the *Lamprophis fuliginosus* complex in Africa. In: 14th European Congress of Herpetology and SEH Ordinary General Meeting, 19–23 September 2007, Porto, Portugal. CBIO, Campus Agrário de Vairão, Vairão, Portugal

Hallowell E (1857) Notice of a collection of reptiles from the Gaboon country, West Africa, recently presented to the Academy of Natural Sciences of Philadelphia, by Dr. Henry A. Ford. Proceedings of the Academy of Natural Sciences of Philadelphia 9: 48–72

Herrmann HJ (1993) Ruder- und Riedfrösche. Baumfrösche mit interessantem Verhalten für attraktive Terrarien. Tetra Verlag, Melle 144 pp.

Hillers A, Loua NA, Rödel MO (2008) A preliminary assessment of the amphibians of the Fouta Djallon, Guinea, West Africa. Salamandra 44: 113–122

Hulselmans JLJ (1970) Preliminary notes on African Bufonidae. Revue de Zoologie et de Botanique Africaines. Tervuren 81: 149–154

Ineich I (1997) Les amphibiens et reptiles du littoral mauritanien. Pp. 93–99. In: Colas P (ed.). Environnement et littoral mauritanien. Actes du colloque. CIRAD, Montpellier, Collections «Colloques»

IUCN (International Union for Conservation of Nature) (1986) Plants in Danger, What do we know? Guinea-Bissau. IUCN, Gland, Switzerland, 155 pp.

IUCN (International Union for Conservation of Nature) (1991) Protected areas of the World: a review of national systems. Volume 3: Afrotropical. IUCN, Gland, Switzerland and Cambridge, UK, 360 pp.

IUCN (International Union for Conservation of Nature) (1992) The Conservation Atlas of Tropical Forests, Africa. Macmillan Publ. Ltd, UK, 287 pp.

Joger U (1979) Zur Ökologie und Verbreitung wenig bekannter Agamen Westafrikas . Salamandra 15: 31–52

Joger U (1981) Zur Herpetofaunistik Westafrikas. Bonner zoologische Beiträge 32: 297–340

Joger U (1984) Taxonomische Revision der Gattung *Tarentola* (Reptilia: Gekkonidae). Bonner zoologische Beiträge 35: 129–174

Joger U, Lambert MRK (2002) Inventory of amphibians and reptiles in SE Senegal, including the Niokola-Koba National Park, with observations on factors influencing diversity. Tropical Zoology 15: 165–185

Joop W (1968) Meyers Kontinente und Meere, Afrika. Bibliographisches Institut Mannheim/Zürich, 380 pp.

Kelly CMR, Barker NP, Villet MH, Broadley DG, Branch WR (2008) The snake family Psammophiidae (Reptilia: Serpentes): Phylogenetics and species delimitation in the African sand snakes (*Psammophis* Boie, 1825) and allied genera. Molecular Phylogenetics and Evolution 47: 1045–1060

Kelly CMR, Branch WR, Broadley DG, Barker NP, Villet MH (2011) Molecular systematics of the African snake family Lamprophiidae Fitzinger 1843 Serpentes Elapoidea with particular focus on the genera *Lamprophis* Fitzinger 1843 and *Mehelya* Csiki 1903. Molecular Phylogenetics and Evolution 58: 415–426

Klaptocz A (1913) Reptilien, Amphibien u. Fische aus Französisch Guinea. Zoologische Jahrbücher für Systematik, Jena 34: 279–290

Knapp R (1973) Die Vegetation von Afrika. Gustav Fischer Verlag, Stuttgart, 626 pp

Kryštufek B, Kletečki E (2007) Biogeography of small terrestrial vertebrates on the Adriatic landbridge islands. Folia Zoology 56: 225–234

Lamotte M, Xavier F (1966) *Phrynobatrachus natalensis* (Smith) et *Phrynobatrachus francisci* (Boulenger): deux espèces de l'Ouest africain difficiles à distinguer. Bulletin de l'Institut Fondamental d'Afrique Noire (I.F.A.N.), sér. A 28: 343–361

Lamotte M, Perret JL (1961) Contribution à l'étude des Batraciens de l' Ouest africain. XIII. – Les formes larvaires de quelques espèces de *Leptopelis*: *L. aubryi, L. viridis, L. anchietae, L. ocellatus* et *L. calcaratus*. Bulletin de l'Institut Fondamental d'Afrique Noire (I.F.A.N.), sér. A 23: 855–885

Lamotte M, Ohler A (1997) Redécouverte de syntypes de *Rana bibroni* Hallowell, 1845, désignation d'un lectotype et description d'une espèce nouvelle de *Ptychadena* (Amphibia, Anura). Zoosystema 19: 545–555

Lamotte M (1971) Le Massif des Monts Loma (Sierra Leone). Fasc. I. XIX. Amphibiens. Mémoires de l'Institut Fondamental D'Afrique Noire 86: 397–407

Laurent RF (1954) Remarques sur le genre *Schoutedenella* Witte. Annales du Musée Royal du Congo Belge, Tervuren 1: 34–40

Laurent RF (1972a) Amphibiens. Exploration du Parc National des Virunga. Deuxième Série. Bruxelles 22: 1–125

Laurent RF (1972b) Tentative revision of the genus *Hemisus*. Annales du Musee Royal de l'Afrique Centrale. Serie in Octavo, Science Zoologique. Tervuren 194: 1–67

Leaché AD, Rödel M-O, Linkem CW, Diaz RE, Hillers A, Fujita MK (2006) Biodiversity in a forest island: reptiles and amphibians of the West African Togo Hills. Amphibian and Reptile Conservation 4: 22–45

Limoges B (1989) Résultats de l'inventaire faunique au niveau national et propositions de modifications à la loi sur la chasse. CECI/UICN/MDRA. Bissau, 145 pp

Limoges B, Robillard M (1991a) Proposition d'un plan d'amenagement de la reserve de la biosphere de l'archipel des Bijagós. Vol. 1 – Les secteurs de développement, zonages et recommandations. CECI/IUCN, 271 pp.

Limoges B, Robillard M (1991b) Proposition d'un plan d'amenagement de la reserve de la biosphere de l'archipel des Bijagós. Vol. 2 – Les espèces animales, distributions et recommandations. CECI/IUCN, 139 pp.

Loveridge A (1939) Revision of the African Snakes of the genera *Mehelya* and *Gonionotophis*. Bulletin of the Museum of Comparative Zoology 86: 131–162

Loveridge A (1940) Revision of the African snakes of the genera *Dromophis* and *Psammophis*. Bulletin of the Museum of Comparative Zoology 87: 1–70

Loveridge A (1944) Further Revisions of African Snake Genera. Bulletin of the Museum of Comparative Zoology Vol XCV, No. 2, 247 pp.

Loveridge A (1941) Revision of the African lizards of the family Amphisbaenidae. Bulletin of the Museum of Comparative Zoology 87: 353–451

Loveridge A (1947) Revision of the African lizards of the family Gekkonidae. Bulletin of the Museum of Comparative Zoology 98: 1–469

Manaças S (1947) Batráquios Aglossos da Guiné Portuguesa. Anais da Junta de Investigações Coloniais III, 65–69

Manaças S (1949) Batráquios Fancroglossus da Guiné Portuguesa. Anais da Junta de Investigações Coloniais. Tomo IV, Vol. IV, 145–164

Manaças S (1950) As Exploracoes Zoológicas Africanas e a Batracologia – Batraquios da Guiné. Anais da Junta de Investigações Coloniais VI, 12 pp.

Manaças S (1951a) Batráquios Aglossos da Guiné Portuguesa. Anais da Junta de Investigações Coloniais III, 289–290

Manaças S (1951b) Sáurios da Guiné Portuguesa. Anais da Junta de Investigações Coloniais IV, 55–67

Manaças S (1955) «Missions de Prof. F. Frade en Guiné-Bissau» Reptiles. Anais da Junta de Investigações Coloniais X, 189–213

Manaças S (1981) Ofideos venenosus da Guiné, S. Tomé, Angola e Moçambique. Garcia de Orta, Sér. Zool. Lisboa 10: 13–46

Measey J, Vences M, Drewes RC, Chiair Y, Melo M, Bourles B (2007) Freshwater paths across the ocean : molecular phylogeny of the frog *Ptychadena newtoni* gives insights into amphibian colonization of oceanic islands. Journal of Biogeography 34: 7–20

Mertens R (1964) Die Reptilien von Fenando Poo. Bonner zoologische Beiträge 15: 211–238

Mocquard F (1908) Descriptions de quelques reptiles et dun batracien nouveaux de la collection du Muséum. Bulletin du Muséum National d'Histoire, Paris 14: 259–262

Monard A (1938) Note sur la faune de la Guinée Portugaise. 2ième parte, CIAO III: 95–97

Monard A (1940a) Résultats de la Mission scientifique du Dr. Monard en Guinée Portugaise 1937–1938, VI – Batraciens. Arquivos do Museu Bocage 11: 77–89

Monard A (1940b) Résultats de la Mission scientifique du Dr. Monard en Guinée Portugaise 1937–1938, VIII – Reptiles. Arquivos do Museu Bocage 11: 147–180

Naurois R de (1969) Peuplements et cycles de reproduction des oiseuax de la côte occidentale d'Afrique, du Cap Barbas, Sahara Espagnol, à la frontière de la République de Guinée. Mémoires du Muséum national d'Histoire naturelle 56: 1–312

Pauwels OSG, Christie P, Honorez A (2006) Reptiles and national parks in Gabon, Western Central Africa. Hamadryad 30: 181–196

Pauwels OSG, David P (2008) Miscellanea Herpetologica Gabonica I. Hamadryad 32: 13–18

Pauwels OSG, Vande weghe JP (2008) Reptiles du Gabon. Smithsonian Institution, 272 pp.

Perret JL (1976) Revision des amphibiens Africains et principalement des types, conservés au Musée Bocage de Lisbonne. Arquivos do Museu Bocage 6: 15–34

Perret JL (1988) Les espèces de *Phrynobatrachus* (Anura, Ranidae) à éperon palpébral. Archives de Sciences, Genève 41: 275–294

Queiroz de K (2005) The ressurection of oceanic dispersal in historical biogeography. Trends in Ecology and Evolution 20: 68–73

Riquier M, Böhme W (1996) Bemerkungen zu Verbreitung und geographischer Variation sowie zu Freileben und Haltung der Lianennatter, *Thelotornis kirtlandii* (Hallowell, 1844). herpetofauna 18: 27–34

Rödel MO (1995) *Phrynobatrachus francisci* im Comoé-Nationalpark, Elfenbeinküste: Lebensräume, Aktivität und Nahrung in der ausgehenden Trockenzeit. Salamandra 31: 79–92

Rödel MO (2000) Herpetofauna of West Africa, Vol. I: Amphibians of the West African savannah. Edition Chimaira, Frankfurt/M., 335 pp.

Rödel MO, Bangoura MA (2004) A conservation assessment of amphibians in the Forêt Classée du Pic de Fon, Simandou Range, southeastern Republic of Guinea, with the description of a new *Amnirana* species (Amphibia Anura Ranidae). Tropical Zoology, 17: 201–232

Rödel MO, Adeba PJ, Ernst R, Hillers A, Gilles S, Nago A, Penner J, Wegman M (2008) Threatened Islands of Amphibian Diversity in West Africa Pp. 62–63. In: Stuart S, Hoffmann M, Chanson J, Cox N, Berridge R, Ramani P, Young B (eds) Threatened Amphibians of the World. Lynx Editicions, Barcelona, Spain. IUCN, Gland, Switzerland; and Conservation International, Arlington, Virginia, USA, 758 pp.

Rödel MO, Sandberger L, Penner J, Youssouph M, Hillers A (2010) The taxonomic status of *Hyperolius spatzi* Ahl, 1931 and *Hyperolius nitidulus* Peters, 1875 (Amphibia: Anura: Hyperoloiidae). Bonn zoological Bulletin 57: 177–188.

Said AR, Fonseca da JF (1990) Étude Socio-Économique des Îles Bijagos, deuxième partie, Rapport de l'Agronome, INEP (Instituto Nacional de Estudos E Pesquisa), Bissau

Schätti B (1986) Herpetologische Ausbeute einer Sammelreise nach Mali (Amphibia, Reptilia). Revue suisse de Zoologie 93: 765–778

Schiotz A (1967) The Treefrogs (Rhacophoridae) of West Africa. Spolia Zoologica Musei Hauniensis 25: 346 pp.

Schiotz A (1971) The superspecies *Hyperolius viridiflavus* (Anura). Videnskabelige Meddeleser fra Dansk Naurhistorisk Forening i Kjobenhavn 134: 21–76

Schiotz A (1999) Treefrogs of Africa. Chimaira Verlag, Frankfurt, Germany, 350 pp.

Schmidt KP (1933) The reptiles of the Pulitzer Angola expedition. Annals of the Carnegie Museum 22: 1–15

Schmitz A, Mausfeld P, Hekkala E, Shine T, Nickel H, Amato G, Böhme W (2003) Molecular evidence for species level divergence in African Nile Crocodiles *Crocodylus niloticus* (Laurenti, 1786). Comptes Rendus Palevol 2: 703–712

Spieler M (1997) Anpassungen ausgewählter Froschlurche and Trockenstreß und Räuberdruck in einer westafrikanischen Savanne. Salamandra 33: 133–152

Stuart SN, Adams RJ (1990) Biodiversity in sub-Saharan Africa and its islands. Occasional Papers. IUCN Species Survival Commission. 242 pp.

Tinsley RC, Loumont C, Kobel HR (1996) Geographical distribution and ecology. Pp. 35–59. In: Tinsley RC, Kobel HR (eds) The Biology of *Xenopus*. Oxford Univ. Press, New York, 440 pp.

Trape JF (2005) Note sur quelques serpents méconnus du Burkina Faso de la collection de Benigno Roman. Bulletin de al Société Herpétologique de France 116: 39–49

Trape S (2007) First record of the skink *Chalcides armitagei* Boulenger, 1920 in coastal areas of Guinea-Bissau and Senegal. Herpetozoa 20 (3/4): 189–191

Trape JF, Chirio L, Broadley DG, Wüster W (2009) Phylogeography and systematic revision of the Egyptian cobra (Serpentes: Elapidae: *Naja haje*) species complex, with the description of a new species from West Africa. Zootaxa 2236: 1–25

Trape JF, Mané Y (2000) Les serpents des environs de Dielmo (Sine-Saloum, Sénégal). Bulletin de al Société Herpétologique de France 95: 19–35

Trape JF, Mané Y (2002) Les serpents du Sénégal: liste commentée des espèces. Bulletin de la Société de Pathologie Exotique (Paris) 95: 148–150

Trape JF, Mané Y (2006) Le genre *Dasypeltis* Wagler (Serpentes: Colubridae) en Afrique de l'Ouest: description de trois espèces et d'une sous-espèce nouvelles. Bulletin de al Société Herpétologique de France 119: 27–56

Trape JF, Mané Y, Ineich I (2006) *Atractaspis microlepidota, A. micropholis* et *A. watsoni* en Afrique occidentale et centrale. Bulletin de al Société Herpétologique de France 119: 5–16

Trape JF, Trape S, Chirio L (2012) Lézards, crocodiles et tortues d'Afrique occidentale et du Sahara. Marseille, IRD Editions, 503 pp.

Vences M, Vieites DR, Glaw F, Brinkmann H, Kosuch J, Veith M, Meyer A (2003) Multiple overseas dispersal in amphibians. Proceedings of the Royal Society London 270: 2435–2442

Vences M, Kosuch J, Rödel M-O, Lötters S, Channing A, Glaw F, Böhme W (2004) Phylogeography of *Ptychadena mascareniensis* suggests transoceanic dispersal in a widespread African-Malagasy frog lineage. Journal of Biogeography 31: 593–601

Villiers A (1950) La collection de serpents de l'IFAN. Dakar, Institut Fondamental d'Afrique Noire (I.F.A.N.), Catalogues, VI, 155 pp.

Villiers A (1963) Les Serpents de l'Ouest Africain. Institut Fondamental d'Afrique Noire (I.F.A.N.), Dakar, 190 pp.

Villiers A (1975) Les Serpents de l'Ouest Africain. Initiations et Études Africaines, No. II, 3e Éd., Université Dakar, 190 pp.

Wagner P, Wilms TM, Bauer A, Böhme W (2009) Studies on African *Agama* V. On the origin of *Lacerta agama* Linnaeus, 1758 (Squamata: Agamidae). Bonner zoologische Beiträge 56: 215–223

Wagner P (2010) Diversity & distribution of African Reptiles, with a special focus on Agamid Lizards. Unpublished Ph.D. Thesis, University of Bonn, 374 pp.

Waitkuwait WE (1985) Contribution a l'Étude des Crocodiles en Afrique de l'Ouest. Nature et Faune 1: 13–29

Walker RB (1968) The amphibians of Zaria, in the northern Guinea Savannah, Nigeria. Copeia: 164–167

Wanger TC (2005) The Amphibians of Kiang West National Park, The Gambia. Salamandra 41: 27–33

Wermuth H (1967) Liste der rezenten Amphibien und Reptilien: Agamidae. Das Tierreich 86: 1–127

The World Factbook (2012) Washington, DC: Central Intelligence Agency, 2012. https://www.cia.gov/library/publications/the-world-factbook/index.html

Appendix 1

Checklist of the herpetofauna of Guinea-Bissau.

AMPHIBIA

Artholeptidae
***Arthroleptis poecilonotus* Peters, 1863**
Localities.– Guinea-Bissau.
References.– Manaças (1949, 1950).
Remarks.– The species is recognized as a member of a species complex (Rödel & Bangoura 2004); the taxonomic status of *A. poecilonotus* in Guinea-Bissau requires verification.

***Leptopelis bufonides* (Günther, 1868)**
Localities.– Orango Isl., Bubaque Isl.
References.– Present study.

***Leptopelis viridis* (Boulenger, 1906)**
Localities.– Bolama Isl., Orango Isl., Bubaque Isl.
References.– Bocage (1896a), Boulenger (1905), Manaças (1949), present study.
Remarks.– Manaças (1949, 1950) published a record from Bolama Isl. as *Leptopelis bocagei* (Günther, 1865), but the occurrence of this species in western Africa is questionable as the westernmost confirmed record is from Central Africa (eastern Cameroon) (Rödel 2000). Therefore we suggest that this specimen might refer to *L. viridis*.

Bufonidae
***Amietophrynus maculatus* (Hallowell, 1854)**
Localities.– Orango Isl.
References.– Present study.

***Amietophrynus regularis* (Reuss, 1833)**
Localities.– Bissau, Ponta do Marques Mano, Bissalanca, Tor, Bissoram; Enxalé, Contubo-el, Catió, Cacheu, Bolama Isl., Pecixe, Mansoa, Cacine, Pitche, Orango Isl.
References.– Monard (1940a), Manaças (1949, 1950), Naurois (1969).

Hemisotidae
***Hemisus guineensis* Cope, 1865**
Localities.– Bolama Isl., Bubaque Isl., Orango Isl.
References.– Boulenger (1905), Manaças (1949, 1950), present study.

Hyperoliidae
***Hyperolius concolor* (Hallowell, 1844)**
Localities.– Ponta de Marques Mano, Cutia, Pitche, Bolama Isl., Ponta Robalo, Bissalanca, Bissau, Sansanto (Mansoa).
References.– Boulenger (1905), Manaças (1949, 1950), Monard (1940a), Naurois (1969). *Remarks.*– *Hyperolius guineensis* Ahl, 1931 is considered as a synonym of *H. concolor* and was listed next to *H. concolor* by Monard (1940a), Manaças (1949, 1950), Naurois (1969).

***Hyperolius nitidulus* Peters, 1875**
Localities.– Bubaque Isl.
References.– Present study.

***Hyperolius occidentalis* Schiotz, 1967**
Localities.– Bubaque Isl.
References.– Present study.

***Hyperolius spatzi* Ahl, 1931**
Localities.– Bubaque Isl.
References.– Present study.

***Kassina senegalensis* (Duméril & Bibron, 1841)**
Localities.– Bubaque Isl.
References.– Present study.

Ranidae
***Hoplobatrachus occipitalis* (Günther, 1858)**
Localities.– Ponta de Marques Mano, Bissalanca, Tor, Prabis, S. Domingos, Gabu, Bafatá, Canchungo, Calequisse, Pecixe, Bissoram, Mansoa, Catió, Bolama Isl., Antula, Bambadinca, Sambel n'antá, Farim, Buba,
References.– Ferreira (1902), Boulenger (1905), Monard (1940a), Manaças (1949, 1950).

***Hylarana galamensis* (Duméril & Bibron, 1841)**
Localities.– Bissau, Catió, Cacheu
References.– Monard (1940a), Manaças (1949, 1950).

Pipidae
***Pseudhymenochirus merlini* Chabanaud, 1920**
Localities.– Pitche (Gabu), Contubo-el
References.– Monard (1940a), Manaças (1947, 1950, 1951a)

***Silurana tropicalis* (Gray, 1864)**
Localities.– Ilha de Bissau, Bolama Isl., Calequisse (Canchungo), Bubaque Isl., Imbone Isl.
References.– Manaças (1947, 1950, 1951a), present study

Phrynobatrachidae
***Phrynobatrachus calcaratus* (Peters, 1863)**
Localities.– Bubaque Isl.
References.– Present study.

***Phrynobatrachus francisci* Boulenger, 1912**
Localities.– Orango Isl., Bubaque Isl.
References.– Present study.

***Phrynobatrachus minutus* (Boulenger, 1895)**
Localities.– Bolama Isl.
References.– Manaças (1949, 1950).
Remarks.– listed as *Arthroleptis minutus; Phrynobatrachus minutus* is endemic to Ethiopia, congeners of *Arthroleptis* recorded from Guinea-Bissau remain valid species (see below).

***Phrynobatrachus natalensis* (Smith, 1849)**
Localities.– Pitche.
References.– Monard (1940a), Manaças (1949, 1950).

***Phrynobatrachus tokba* (Chabanaud, 1921)**
Localities.– Dandum (Boé).
References.– Monard (1940a), Manaças (1949, 1950).
Remarks.– Listed as *Arthroleptis "tobka"*.

Ptychadenidae
***Ptychadena ansorgii* (Boulenger, 1905)**
Localities.– Cacine.
References.– Manaças (1949, 1950).

***Ptychadena bibroni* (Hallowell, 1845)**
Localities.– Ponte de Marques Mano, Bissoram, Mansoa, Madina-Boé, Caïra, Catió, Orango Isl., Bubaque Isl..
References.– Monard (1940a), Manaças (1949, 1950), Naurois (1969), present study.

***Ptychadena mascareniensis* (Duméril & Bibron, 1841)**
Localities.– Bissau, Ponta Robalo, Ponta de Marques Mano, Bissoram, Prábis; Catió, Enxalé, Contubo-el, Pitche, Bolama Isl., Gabu, Madina do Boé, Caíra, Cacine, Mansoa, Cutiá.
References.– Bocage (1896a), Boulenger (1905), Manaças (1949, 1950), Monard (1940a), Naurois (1969).

***Ptychadena oxyrhynchus* (Smith, 1849)**
Localities.– Bolama Isl.
References.– Manaças (1950).

***Ptychadena pumilio* (Boulenger, 1920)**
Localities.– Orango Isl.
References.– Present study.

Reptilia
Testudines
Cheloniidae
***Caretta caretta* (Linnaeus, 1758)**
Localities.– Bijagós archipelago.
References.– Limoges (1989), Catry et al. (2009).

***Chelonia mydas* Linnaeus, 1758**
Localities.– Bijagós archipelago.
References.– Bocage (1896a), Limoges (1989), Limoges & Robillard (1991b).

***Eretmochelys imbricata* (Linnaeus, 1766)**
Localities.– Bijagós archipelago.
References.– Limoges (1989), Limoges & Robillard (1991b).

***Lepidochelys olivacea* (Eschscholtz, 1829)**
Localities.– Bijagós archipelago.
References.– Limoges & Robillard (1991b).

Dermochelyidae
***Dermochelys coriacea* (Vandelli, 1761)**
Localities.- Bijagós archipelago, mainland
References.- Limoges & Robillard (1991b), Catry et al. (2009)

Pelomedusidae
***Pelomedusa subrufa* (Lacepède, 1788)**
Localities.– Cufada, Cufar, Catio, Cacine.
References.– Garcia (1991).

***Pelusios castaneus* (Schweigger, 1812)**
Localities.– Bissau, Ponte Robalo, Catió, Cacheu, Catanhez, Enu, Joäo Vieira, Bubaque Isl., Orango Isl.
References.– Bocage (1867), Broadley (1981), Garcia (1991), Monard (1940b), Limoges (1989), Limoges & Robillard (1991b), present study [party mentioned as *Pelusios subniger*].

Testudinidae
***Kinixys belliana nogueyi* (Lataste, 1886)**
Localities.– Bolama Isl.
References.– Bocage (1896a), Garcia (1991).

***Kinixys homeana* Bell, 1827**
Localities.– Cajadude, Boé.
References.– Limoges (1989), Garcia (1991).

Trionychidae
***Cyclanorbis senegalensis* (Duméril & Bibron, 1835)**
Localities.– Cufada.
References.– Present study.

***Trionyx triunguis* (Forskål, 1775)**
Localities.– Bissau, Corubal, Cufada
References.– Bocage (1867), Limoges (1989), Garcia (1991).
Remarks.– Listed by Bocage (1867) as *Gymnopus aegyptiacus*.

SAURIA

Amphisbaenidae

***Cynisca feae* (Boulenger, 1906)**
Localities.– Rio Cacine, Ponta de Marques Mano, Bissalanca, Bubaque.
References.– Gans (1987), Manaças (1955).

***Cynisca leonina* (Müller, 1885)**
Localities.– Rio Pongo.
References.– Loveridge (1941), Gans (1987).

***Cynisca oligopholis* (Boulenger, 1906)**
Localities.– Rio Cacine.
References.– Loveridge (1941), Gans (1987).

Agamidae

***Agama boensis* Monard, 1940 | *Agama sankaranica* Chabanaud, 1918**
Localities.– Madina Boé, Pitche.
References.– Manaças (1951b), Grandison (1968), Joger (1979).
Remarks.– According to Grandison (1968), Monard (1940b) described *Agama boensis* on the basis of a series intermingled with adult specimens referring to *A. sankaranica* and juveniles referring to *A. weidholzi*. Later, *A. boensis* is often recognized as subspecies of *Agama agama* (e.g. Wermuth 1967), which is in fact very doubtful. Manaças (1951b) collected three specimens assigned to to *A. boensis* while Wagner (2010) recognized *A. boensis* as valid species. In this context *A. boensis* should be added to the herpetofauna of Guinea-Bissau, but further research is needed to clarify the presence of *A. sankaranica* within the country.

***Agama picticauda* Peters, 1877**
Localities.– Bissau, Ponta Robalo, Ponta de Marques Mano, Tor, Biombo, Samá, Pitche, Enxalé, Bolama Isl., Farim, Mansoa, Contubo-el, Madina do Boé, Gabu, Ilha Formosa, Bambadinca, Pecixe, Canchungo, Bissalanca, Bafatá, Bissorã, Chitole, Rio Cacine, Capé, Bor, Uno, Bubaque, Soga
References.– Boeage (1896a), Ferreira (1902), Boulenger (1905), Monard (1940b), Manaças (1950, 1951b), Frade (1950), Garcia (1991), Naurois (1969), present study
Remarks.– Listed as *Agama colonorum* by Bocage (1896a), Ferreira (1902), Monard (1940b) and Manaças (1951b).

***Agama weidholzi* Wettstein, 1932**
Localities.– Madina do Boé, Pitche.
References.– Joger (1979), Monard (1940b), Grandison (1968).
Remarks.– Monard (1940b) described *A. boensis* (see above) on the basis of a single voucher of *A. weidholzi* therefore this was the first record of the species from Guinea-Bissau.

Chamaeleonidae

***Chamaeleo gracilis* Hallowell, 1842**
Localities.– Bissau, Antula, Ponta de Marques Mano, Brene, Tor, Prábis, Bissalanca, Bissoram, Canchungo, Bissoram, Cacheu, Bilama, Chitole, Rio Cacine, Farim, Canchungo, Mansoa, Catió, Nhampurbane (Gabu), Farim, Rio Cacine, Ponta Robalo, Cantubo-el, Pitche, Cacheu, Bolama Isl., Contabani, Orango Isl.
References.– Bocage (1896a), Ferreira (1902), Boulenger (1905), Manaças (1951b), , Gardete-Correira (1971–73), Garcia (1991), present study.

***Chamaeleo senegalensis* Daudin, 1802**
Localities.– Bissoram, Pitche, Cacheu, Mansoa, Catió, Contubo-el, Bijimita, Rio Cacine, Caravela.
References.– Monard (1940b), Manaças (1951b), Limoges & Robillard (1991b).

Gekkonidae

***Hemidactylus angulatus* Hallowell, 1854**
Localities.– Bissau, Ponta Robalo, Ponta de Marques Mano, Bissalanca, Samá, Pitche, Madina do Boé, Bolama Isl., Geba, Mansoa, Pitche, Chitole, Catió, Cacine, Rio Cacine, Bubaque, Orango, Soga.
References.– Bocage (1896a), Ferreira (1902), Boulenger (1905), Monard (1940b), Manaças (1951b), Garcia (1991), present study.

***Lygodactylus gutturalis* (Bocage, 1873)**
Localities.– Bissau, Geba, Contubo-el, Madina do Boé, Pitche, Bolama Isl., Orango Isl., Imbone Isl., Soga Isl., Bubaque Isl.
References.– Bocage (1873), Garcia (1991), Monard (1940b), Loveridge (1947), present study.

Lacertidae

***Latastia ornata* Monard, 1940**
Localities.– Bafatà (Fig. 28).
References.– Monard (1940b).
Remarks.– Additional records remain outstanding; the only West African congener recorded in coastal wetlands of Mauritania (Inciceh 1997) and coastal Senegal (Böhme 1978) is *L. longicaudata* (Reuss, 1839).

Phyllodactylidae

***Tarentola ephippiata senegambiae* Joger, 1984**
Localities.– Ponta de Marques Mano, Tor, Antula, Biombo, Bissalanca, Enxalé, Mansoa, Contubo-el, Bafatá, Pitche, Canchungo, Farim, and Mansoa present study (Fig. 29).
References.– Boulenger (1905), Monard (1940b), Manaças (1951b), Joger (1981, 1984).

Remarks.– Considered as a full species by Trape et al. (2012).

Scincidae

***Chalcides armitagei* Boulenger, 1922**
Localities.– Sucujaque, coastal Guinea-Bissau
References.– Trape (2007)
Remarks.– Previously considered endemic to coastal dunes in The Gambia (Gruschwitz et al. 1991).

***Chalcides pulchellus* Mocquard, 1906**
Localities.– Madina do Boé.
References.– Monard (1940b).
Remarks.– *C. pulchellus* is restricted to western Guinea, southeastern Senegal and Mali, whereas *C. thierryi* occurs further south extending into northern Ghana and the east of Nigeria (Joger & Lambert 2002, Greenbaum et al. 2006).

***Mochlus guineensis* Peters, 1879**
Localities.– Rio Corubal e Cacine.
References.– Boulenger (1905), Manaças (1951b).

***Panaspis tristaoi* Monard, 1940**
Localities.– Corubal.
References.– Monard (1940b), Naurois (1969).

***Trachylepis affinis* (Gray, 1838)**
Localities.– Bissau, Ponta de Marques Mano, Bissalanca, Bissoram, Geba, Antula, Bolama Isl. Isl., Cacheu, Rio Cassine, Farim, Canchungo, Calequisse, Pecixe, Mansoa, Madina do Boé, Enxalé, Orango Isl., Bubaque Isl.
References.– Bocage (1896a), Ferreira (1902), Boulenger (1905), Monard (1940b), Manaças (1951b), Naurois (1969), Garcia (1991), present study.

***Trachylepis perrotetii* (Duméril & Bibron, 1839)**
Localities.– Bissau, Bolama Isl. Isl., Farim, Cacheu, Mansoa, Madina do Boé, Canchungo, Calequisse, Cacine, Bissoram, Farim, Soga Isl., Bubaque Isl.
References.– Bocage (1896a), Boulenger (1905), Monard (1940b), Manaças (1951b), Gardete-Correira (1971–73), Garcia (1991), present study.

Varanidae

***Varanus exanthematicus* (Bosc, 1792)**
Localities.– Bissau (present study, ZFMK 58311), Buba, Bissalanca, Tor, Brene, Pitche, Pecixe, Canchungo, Bolama Isl., and Bijagós archipelago.
References.– Bocage (1896a), Boulenger (1905), Limoges & Robillard (1991b), Garcia (1991),

***Varanus niloticus* (Linnaeus, 1758)**
Localities.– Bissau, Brene, Bigimita, Formosa, Bambadinca, Ponta Robalo, Bolama Isl., Dungal, Corubal, Varala, Orango Isl., Soga Isl., Bubaque Isl., Caravela Isl., Carache Isl., Uno Isl., Canhabaque, Cä-Balanta.
References.– Bocage (1866), Ferreira (1902), Boulenger (1905), Monard (1940b), Manaças (1951b, 1955), Naurois (1969), Limoges (1989), Limoges & Robillard (1991b), Garcia (1991), present study.

SERPENTES

Colubridae

***Crotaphopeltis hotamboeia* (Laurenti, 1768)**
Localities.– Bissau, Contubo-el, Cacheu, Marques Mano, Bijimita, Bissalanca, Ponta de Machado, Bafatá.
References.– Monard (1940b), Manaças (1955), Chippaux (2006).

***Dasypeltis confusa* Trape & Mané, 2006**
Localities.– Bissau, Bissalanca, Rio Cacine.
References.– Bocage (1867, 1896a), Manaças (1955), Gardete-Correira (1971–73), Naurois (1969), Trape & Mané (2006), Chippaux (2006).
Remarks.– *Dasypeltis scaber scaber* was recorded from Guinea-Bissau. Scalation data matches with that of *D. confusa* described by Trape & Mané (2006), thus assigning *D. s. scaber* as a synonym of *D. confusa*. Trape & Mane (2006) further record this species from Senegal, Guinea and Benin.

***Dispholidus typus* (Smith, 1829)**
Localities.– Bolama Isl., Cacheu, Rio Cacine.
References.– Bocage (1896b), Manaças (1955).

***Grayia smithii* (Leach, 1818)**
Localities.– Madina Boé, Bissau.
References.– Monard (1940b), Manaças (1955), Gardete-Correira (1971–73), Chippaux (2006).
Remarks.– The sympatric *G. tholloni* was mistaken with a Senegal record of *G. smithii* by Villiers (1950), as was determined by Trape & Mané (2000). However the record here provided by the authors matches with *G. smithii* with respect to scalation data.

***Hapsidophrys smaragdina* (Schlegel, 1837)**
Localities.– Bolama Isl.
References.– Bocage (1896b).

***Natriciteres olivacea* (Peters, 1854)**
Localities.– Guinea-Bissau.
References.– Frade et al. (1946), Naurois (1969).
Remarks.– The species has been recorded in Guinea (Broadley 1966) and Burkina Faso (Trape 2005), in Chippaux (2006), the species' most northern distribution along the West African forest belt is Sierra Leone.

***Philothamnus heterodermus* (Hallowell, 1857)**
Localities.– Catió, Madina do Boé, Orango Isl.
References.– Monard (1940b), present study.

***Philothamnus heterolepidotus* (Günther, 1863)**
Localities.– Ponte Robalo, Caita.
References.– Monard (1940b).
Remarks.– Sierra Leone is the most northwestern distribution of the species (Chippaux 2006).

***Philothamnus irregularis* (Leach, 1819)**
Localities.– Bissau, Cacheu, Bolama Isl., Pimenta, Pitche, Barahona, Ponte Robalo.
References.– Bocage (1896a), Monard (1940b), Gardete-Correira (1971–73).

***Philothamnus semivariegatus* (Smith, 1847)**
Localities.– Bissau.
References.– Gardete-Correira (1971–73).

***Thelotornis kirtlandii* (Hallowell, 1844)**
Localities.– Bubaque Isl., "Portuguese Guinea"
References.– Riquier & Böhme (1996), Loveridge (1944), present study.

***Toxycodryas blandingii* (Hallowell, 1844)**
Localities.– Bissau, Bissalanca, Soga Isl., Bubaque Isl.
References.– Manaças (1955), present study.

Elapidae
***Elapsoidea semiannulata moebiusi* Werner, 1897**
Localities.– Bubaque Isl., Bissau, Rio Cacine
References.– Loveridge (1944), Naurois (1969), Manaças (1981).

***Dendroaspis jamesoni* (Traill, 1843)**
Localities.– Bissau, Bolama Isl.
References.– Bocage (1896a, b, 1888), Naurois (1969), Manaças (1981).

***Dendroaspis viridis* (Hallowell, 1844)**
Localities.– Bolama Isl.. Bubaque Isl.
References.– Naurois (1969), Manaças (1981).

***Naja haje* (Linnaeus, 1758)**
Localities.– Bolama Isl.
References.– Garcia (1991).

***Naja melanoleuca* Hallowell, 1857**
Localities.– Contubo-el, Bolama Isl., Farim, Bubaque Isl.
References.– Monard (1940b), Manaças (1981), present study.

***Naja nigricollis* Reinhardt, 1843**
Localities.– Bolama Isl., Bambadinca, Aldeia de Cuor, Bissau, Buba, Bijagós archipelago, Bubaque Isl.
References.– Bocage (1896a), Frade et al. (1946), Manaças (1981), Limoges & Robillard (1991b), present study.

Lamprophiidae
***Atractaspis aterrima* Günther, 1863**
Localities.– Bolama Isl.
References.– Manaças (1981), Chippaux (2006).

***Amblyodipsas unicolor* (Reinhardt, 1843)**
Localities.– Rio Cacine.
References.– Villiers (1963), Broadley (1971), Chippaux (2006).

***Boaedon fuliginosus* (Boie, 1827)**
Localities.– Bubaque Isl., Rio Cacine, Bissalanca, Bigimita.
References.– Boulenger (1905), Naurois (1969), Manaças (1955), Gardete-Correira (1971–73).

***Boaedon lineatus* (Duméril, Bibron & Duméril, 1854)**
Localities.– Cacheu, Bissau, Madina Boé, Rio Cacine, Bolama Isl. Isl., Ponta de Machado.
References.– Bocage (1896a), Boulenger (1905), Monard (1940b), Manaças (1955).

***Gonionotophis grantii* (Günther, 1863)**
Localities.– Guinea-Bissau.
References.– Loveridge (1939), Villiers (1963, 1975), Chippaux (2006).

***Gonionotophis poensis* (Smith, 1847)**
Localities.– Bissau.
References.– Bocage (1873).
Remarks.– Based on current taxonomic revisions all *Mehelya* spp. are included in the genus *Gonionotophis* (Kelly et al. 2011). Bocage received one specimen (*Simocephalus poensis*) from M. Ferreira Borges, and emphasizes its similarity with *Gonionotophis grantii;* however G. *poensis'* most northwestern distribution is southeastern Guinea (Chippaux 2006), thus Bocage's provisional identification may confirm *G. poensis* with a distinct range extension.

***Gonionotophis stenophthalmus* (Mocquard, 1887)**
Localities.– Bissau.
References.– Bocage (1896a), Chippaux (2006).

***Lycophidion albomaculatum* Steindachner, 1870**
Localities.– Bissau, Bolama Isl.
References.– Bocage (1896a), Boulenger (1905), Ferreira (1902), Manaças (1955), Villiers (1975), present study (Fig. 30).
Remarks.– Aforementioned authors assigned the species to *L. semicinctum.*

***Lycophidion irroratum* (Leach, 1819)**
Localities.– Rio Cacine, Bissau, Ponta de Machado.
References.– Boulenger (1905), Manaças (1955), Chippaux (2006).

***Prosymna meleagris* (Reinhardt, 1843)**
Localities.– Mansoa.
References.– Monard (1940b).
Remarks.– Broadley (1980) distinguished two populations, *P. m. melagris* and *P. m. greigerti* and intergrades from Senegal. Trape & Mané (2002) list both populations from the Senegal, however later Trape & Mané (2006) ressurrect *P. meleagris* (Reinhardt, 1843) and *P. greigerti* (Mocquard, 1906), and latter species into, *P. g. greigerti* and *P. g. collaris*. On the basis of Monard's description it is not possible to distinguish between the two, hence *P. meleagris* remains listed here. *P. greigerti* must therefore be considered as a potential species of Guinea-Bissau (see below).

***Psammophis elegans* (Shaw, 1802)**
Localities.– Bissau, Bissalanca, Bigimita, Bolama Isl., Farim, Cacine, Catio.
References.– Bocage (1867, 1896a), Ferreira (1902), Manaças (1955), Gardete-Correira (1971–73).

***Psammophis lineatus* (Duméril, Bibron & Duméril, 1854)**
Localities.– Contubo-el, Rio Cacine, Catió, Bafatá, Ponta de Machado, Bissau
References.– Monard (1940b), Loveridge (1940), Manaças (1955), Gardete-Correira (1971–73), Garcia (1991).
Remarks.– The species was previously included in the genus *Dromophis* (also see Chippaux 2006), and relegated to the synonymy of *Psammophis* by Kelly et al. (2008).

***Psammophis phillipsi* (Hallowell, 1844)**
Localities.– Uno Isl., Bubaque Isl.
References.– Naurois (1969), present study.
Remarks.– See *Psammophis sibilans*.

***Psammophis sibilans* (Linnaeus, 1758)**
Localities.– Bissau, Cacheu, Bolama Isl. Isl., Antula, Rio Cacine, Madina Boé, Catió.
References.– Bocage (1866, 1896b), Ferreira (1902), Monard (1940b), Manaças (1955).
Remarks.– According to Kelly et al. (2008) the *Psammophis sibilans* "species complex" remains unresolved, however the authors provisionally distinguish two lineages, the "*phillipsii*" and "*subtaeniatus*" complex.

Leptotyphlopidae
***Myriopholis narirostris* (Peters, 1867)**
Localities.– Ponta de Marques Mano, Bissalanca, Bissau.
References.– Manaças (1955), Gardete-Correira (1971–73).
Remarks.– The originally described *Glauconia debilis* Chabanaud 1918 has been synonymized with *Leptotyphlops narirostris boueti* (Hahn & Wallach 1998). The species was renamed by Adalsteinsson et al. (2009).

Pythonidae
***Python regius* (Shaw, 1802)**
Localities.– Bissau.
References.– Monard (1940b), present study (Fig. 31).

***Python sebae* (Gmelin, 1789)**
Localities.– Ponte Machado, Bissau, Enchalé, Bor, Bijagós archipelago, Cufada, Catió, Bucaré, Imbone Isl., Orango Isl., Soga Isl., Bubaque Isl.
References.– Bocage (1896a), Frade et al. (1946), Garcia (1991), Naurois (1969), Broadley (1984), Limoges & Robillard (1991b), Chippaux (2006), present study.

Typhlopidae
***Afrotyphlops punctatus* (Leach, 1819)**
Localities.– Ponta de Machado, Bissau, Bolama Isl. Isl., Rio Cacine, Cacheu.
References.– Bocage (1896a), Ferreira (1902), Boulenger (1905), Manaças (1955).
Remarks.– *Typhlops punctatus* was renamed by Broadley & Wallach (2009).

Viperidae
***Bitis arietans* (Merrem, 1820)**
Localities.– Bolama Isl., Antula, Bissau, Bubaque Isl., Orango Isl., Soga Isl.
References.– Bocage (1896a), Ferreira (1902), Manaças (1981), present study.

***Bitis nasicornis* (Shaw, 1802)**
Localities.– Bubaque Isl.
References.– Naurois (1969).

***Causus maculatus* (Hallowell, 1842)**
Localities.– Cacheu, Contubo-el, Rio Cacine.
References.– Manaças (1981), present study (ZFMK 88323).

Crocodylidae
***Crocodylus suchus* Geoffroy, 1807**
Localities.– Rio Geba, Corubal e Cacheu; Contubo-el, Bolama Isl., Nhacra, Orango Isl., Formosa Isl., Imbone Isl., Uno Isl.
References.– Limoges (1989), Limoges & Robillard (1991b), present study.

***Mecistops cataphractus* (Cuvier, 1825)**
Localities.– Rio Cacheu?, Rio Corubal, Cacine.
References.– Garcia (1991), de Buffrenil (1993).

***Osteolaemus tetraspis* Cope, 1861**
Localities.– Antula, Madina do Boé, Formosa, Orango.
References.– Monard (1940b), de Buffrenil (1993), Limoges (1989).

Appendix 2

Previously recognized, but now doubtful records from Guinea-Bissau

Arthroleptidae
***Arthroleptis variabilis* Matschie, 1893**
Localities.– Guinea-Bissau.
References.– Manaças (1949, 1950).
Remarks.- According to Rödel & Bangoura (2004) the species is confined to central Africa.

***Leptopelis cynnamomeus* (Bocage, 1893)**
Localities.– Bolama Isl.
References.– Bocage (1896a).
Remarks.– The species' northern range limit is in the Democratic Republic Congo; according to Perret (1976) the paratypes of *L. cynnamomeus* from Guinea-Bissau are referable to *L. viridis*.

Hyperoliidae
***Hyperolius argus* Peters, 1854**
Localities.– Ponta de Marques Mano, Bolama Isl.
References.– Monard (1938), Manaças (1949, 1950).
Remarks.– Listed as *H. cinctiventris* Cope; *H. argus* is geographically confined to eastern Africa (Frost 2011), hence the orginal *H. cinctiventris* reflects a synonym (at this stage unknown) of a congener native to Guinea-Bissau.

***Hyperolius ferreirai* Noble, 1924**
Localities.– Ponta de Marques Mano, Bissalanca, Caionete, Caió, Contubo-el.
References.– Monard (1940a), Manaças (1949, 1950).
Remarks.– The species appears to be confined to Angola (Frost 2011), hence *H. ferreirai* reflects a synonym (at this stage unknown) of a congener native to Guinea-Bissau.

***Hyperolius marmoratus* Rapp, 1842**
Localities.– Bolama Isl., Geba.
References.– Bocage (1896a), Monard (1940a), Manaças (1949, 1950).
Remarks.– The species appears to be confined to eastern and southern Africa (Frost 2011), hence *H. ferreirai* reflects a synonym (at this stage unknown) of a congener native to Guinea-Bissau. However the taxonomic status of this species complex remains highly distorted and controversial.

Gerrhosauridae
***Gerrhosaurus nigrolineatus* Hallowell, 1857**
Localities.– Bolama Isl.
References.– Ferreira (1902).
Remarks.– Hallowell (1857) describes the species from Gabon, and Pauwels & David (2008) confirm the species for Gabon. The record from Bolama Isl. remains doubtful.

Scincidae
***Chioninia delalandii* (Duméril & Bibron, 1839)**
Localities.– Garcia (1991) mentions "Só se encontra mencionada nas obras de Bocage, vinda de Bissau, no litoral da Guiné", which indicates that "the species was only recorded, as was reported in the studies of Bocage, upon arrival in Bissau in coastal Guinea-Bissau" (Garcia 1991). However, Bocage (1867) lists the species "*Euprepres delalandii*" from the Cape Verde Islands.
References.– Bocage (1867), Garcia (1991).

Lamprophiidae
***Gonionotophis brussauxi* (Mocquard, 1889)**
Localities.– Guinea-Bissau.
References.– Villiers (1963, 1975).
Remarks.– The species is geographically confined to Cameroon, Republic of the Congo and Gabon (Chippaux 2006, Pauwels et al. 2006). A doubtful record for *G. brussauxi* in Togo is indicated by Chippaux (2006), which may in fact refer to *G. klingi*. A record for Guinea-Bissau at this stage must be considered doubtful.

***Lycophidion meleagris* Boulenger, 1893**
Localities.– Guinea-Bissau.
References.– Gardete-Correira (1971–73), Garcia (1991).
Remarks.– Garcia (1991) mentions *L. horstocki* and *L. gambensis* as synonyms of *L. meleagris*. Former is recognized as a synonym of *L. albomaculatum* and *L. capense* while latter synonyms could not be traced. The most northern record of a West African congener, *L. nigromaculatum* (Peters, 1863) is southeastern Guinea (Chippaux 2006). At this stage it is not possible to ascertain the validity of this species.

Viperidae
***Causus rhombeatus* (Lichtenstein, 1823)**
Localities.– Cacheu, Contubo-el, Bissau, Rio Cacine.
References.– Bocage (1896a), Monard (1940b).
Remarks.– This record very likely reflects *C. maculatus*, based on the number of ventrals (137) as indicated by Monard (1940b); in *C. rhombeatus* ventrals count more than 150 (Chippaux, 2006).

